The expression of focus in Hindi: a Dynamic Syntax approach

Andriana Koumbarou

Thesis submitted for the degree of PhD

2020

Department of Linguistics
SOAS, University of London

Abstract

This thesis takes a procedural grammar approach to Hindi clause structure paying special attention to information structural phenomena and interpretive possibilities in the peripheries. It uses the tools of the Dynamic Syntax formalism where syntax is defined as procedures for utterance interpretation in context (Cann, Kempson, & Marten, 2005; Kempson, Meyer-Viol, & Gabbay, 2001), and sets to propose first steps towards a parsing-based analysis of Hindi clause structure, before delving into the expression of focus.

The thesis discusses nominal interpretation in Hindi, as well as the contribution of the *=ne* and *=ko* case markers and verbal morphology in the incremental process of interpretation build-up. It argues that the interpretation of common nouns is strictly context-dependent, which includes the discourse context but also the local linguistic context, i.e. the string of words amongst which realised. Case markers specify how an expression fits within the emerging propositional structure and identify a noun phrase (NP) boundary. The effect of such an analysis is that it captures specific readings of case-marked NPs as context-dependent and rightly predicts the strict NP-final positioning of case markers and the ban on postponing nominal modifiers to the right of a case-marked head. The tense-aspect inflected verb is what drives the accumulation of information on the propositional level compiling all information to yield a truth-conditional formula at the finishing stages of the derivation.

Topic and focus are understood as pragmatic notions that describe the relationship utterance material holds with respect to the context but have no formal significance and no role in the formal analysis itself. Their expression involves the manipulation of universally available grammatical mechanisms in interaction with language-specific lexical instructions and contextual information. The analysis builds on previous semantic work on focus but adds a dynamic twist: it models the stepwise process in which an open proposition is derived and the point in the interpretation process in which focal material provides an 'update' to yield a fully complete truth-conditional formula. The notion of focus receives procedural significance: it is a cover term for context-update interpretive effects achieved in the process of interpretation build-up. This can be an 'update' made by providing a value to an open proposition (question-answer pairs), an 'update' to some propositional structure already construed in the context (corrections) or an 'update' made relative to some partial structure in the immediate context (such as topic-focus sequences).

Acknowledgments

First, I'd like to thank my supervisor, Professor Lutz Marten, for his support and guidance through the ups and downs of my PhD journey. His positive outlook and encouraging words were just what I needed at 'low' times to keep me going. In fact, I am thankful to Lutz for starting a PhD! I nervously knocked on his office door one day to seek advice for applying for a PhD and I left half an hour later full of ideas and inspired to write a research proposal.

I'd also like to thank the other members of my committee, Professor Ruth Kempson and Dr Chris Lucas, for valuable feedback on early and chaotic drafts of this thesis and interesting discussions! In addition, I'd like to thank Dr Maria Flouraki who first introduced me to syntax and semantics. I really enjoyed her classes as a student at SOAS. I later had the chance to be Maria's teaching assistant and I much appreciate her help with that.

I am extremely grateful to Professor Tista Bagchi for making it possible for me to visit Delhi University on a research affiliation. I am thankful for her help (of all sorts!), for introducing me to her students and for all the interesting discussions we have had.

I am also thankful to Dr Rashmi Joshi for welcoming me and introducing me to her students at the Department of Slavonic and Finno-Ugrian Studies at Delhi University. I keep very fond memories of the place!

This thesis would not have been possible without the people I met in India who gave generously of their time to answer my avalanche of questions! I'd like to thank my friends Sarada and Shubham for the great fun we had in Delhi but also for spending countless hours discussing Hindi data with me. I'd also like to thank Kanishka and Nivedita for enduring lengthy elicitation sessions! I am so thankful to Lalit for meeting with me (daily at one point!) in the garden of Arts Faculty. I really enjoyed our chats and I am grateful for all your help. I am thankful to Tara for inviting me so often to her place despite her busy schedule and helping me out with data collection. I'd also like to thank Shairil, Preeti, Sahil, Pooja, Anu for their patience

with all my questions! Many thanks also go to Masha, Zoya, Niti and Ekta who made my stay at the hostel quite memorable! :)

I also gratefully acknowledge the generous support of a SOAS Research Studentship which made it possible for me to enroll as a PhD student.

A very special thanks goes to my family. I am blessed with a large and supportive family. My brother Yavor and sister Sibina are just amazing and I'm grateful to them for always being there to lend a helping hand or just have a good time together! To my mother Galia and my father Panayiotis I owe everything I have managed to achieve so far. I thank my mother for supporting me in my endeavors and making it possible for me to pursue my dreams. I thank my father for always finding words of encouragement and always offering to help with any problem I have! I thank them both for all their continuous support and their unshaken belief in me.

Ivan was there at every step with me from the start to the finish. Thank you for all your support and taking care of absolutely everything, especially while I was at the last stretch of writing (and arguably very hard to live with)! :)

List of glossing abbreviations

Glossing abbreviations are based on the Leipzig Glossing Rules[1]. When data from other authors' published works is cited, I have adapted the glossing for uniformity using the following abbreviations:

1SG	first person singular
1PL	first person plural
2SG	second person singular
2PL	second person plural
3SG	third person singular
3PL	third person plural
ACC	accusative
CAUS	causative
COMP	complementiser
CONJ	conjunctive participle
DAT	dative
DIST	distal demonstrative
EMPH	emphasis
ERG	ergative
EXCL FOC	exclusive focus
F	feminine
FOC	focus
FUT	future
GEN	genitive
IMP	imperative
M	masculine
IMPF	imperfective
M	masculine
IMPF	imperfective
INF	infinitive
NEG	negative
OBL	oblique
PASS	passive
PL	plural
POSS	possessive
PRS	present
PROG	progressive
PROX	proximal demonstrative
PFV	perfective
PST	past
REL	relativiser
SBJV	subjunctive
SG	singular
TOP	topic
M	masculine
IMPF	imperfective
INF	infinitive

[1] These can be accessed from: https://www.eva.mpg.de/lingua/resources/glossing-rules.php (last access: June 2017).

Notes on transcription

The transcription conventions adopted here are commonly used in the literature by linguists working on Hindi. Some transcription conventions used in this thesis for Hindi deviate from International Phonetic Alphabet (IPA). These are summarised in Table 1 below: a double vowel (for example, aa) indicates a long vowel, ai indicates a low front unrounded vowel, au is used for a low back unrounded vowel, a capital N indicates nasalisation on the vowel that precedes it, the voiced postalveolar affricate [d͡ʒ] is indicated with j, a capital R is used for the retroflex flap [ɽ], sh is for the voiceless palato-alveolar fricative [ʃ], r is used for the alveolar flap [ɾ], y is used for the palatal glide [j], retroflex [ɖ] and [ʈ] are indicated with a capital letter – D and T, respectively. For uniformity I have adapted transcriptions of examples cited from published works to reflect the conventions used in this thesis.

Table 1 Transcription conventions used in this thesis that deviate from IPA

IPA	In this thesis	IPA	In this thesis
Vowels		*Consonants*	
ə	a	d͡ʒ	j
aː	aa	ɽ	R
eː	e	ʃ	sh
ɛː	ai	tʃ	ch
iː	ii	ɾ	r
ɪ	i	j	y
oː	o	ʈ	T
ɔː	au	ɖ	D
ʊ	u		
uː	uu		
Nasalisation			
˜	N		

List of tables

List of figures

Contents

1 Introduction

1.1 Background

The way an utterance is organised, i.e. the language-specific syntactic, morphological and/or prosodic strategies involved for the expression of propositional content, is not independent of the discourse context in which the utterance is realised. This is acknowledged in an ever-growing number of studies under the umbrella term *information structure*, first introduced by Halliday (1967), on the relationship between the linguistic form of an utterance and the immediate linguistic but also extra-linguistic context in which it is uttered. See Matić (2015) and Zimmermann (2016) for a recent comprehensive introduction to the term and also Féry and Ishihara (2014) for a collection of articles that discuss information structure from different perspectives.

The observation that contextual factors play a role in the way utterances are formally organised has led to the idea − to use Chafe's (1976) association − that speakers 'package' their utterances for optimising information exchange. Similarly, Prince (1981: 224) describes this observation as "the tailoring of an utterance" in accordance with speaker's assumptions about the hearer's communicative needs. One of the most influential works in this respect is

Lambrecht's (1994) theory of information structure; he proposes that information structure is a component of sentence grammar which determines the structuring of sentences relative to the discourse context.

Information structure is widely understood as the segmentation of sentences into parts with different information status, e.g. what is already known and what is the most informative part of an utterance, usually referred to as *topic* and *focus* respectively. The term *common ground* (Stalnaker, 1974, 1999, 2002, 2014) is often used in the literature on information structure to refer to the constantly increasing information shared between interlocutors in the course of communication. The formal organisation of an utterance reflects speaker's assumptions about immediate communicative needs and the content of the common ground at the point of the utterance (Krifka, 2007, 2008; Krifka & Musan, 2012). Research on information structure concentrates on identifying language-specific linguistic means through which speakers 'code' instructions for the hearer on how information is to be processed, relative to their assumptions about the shared context, i.e. what information is accessible from the context and what is to be presented as 'new'.

To give an illustration, consider the Hindi examples in (1)-(2) (the hash symbol (#) indicates unacceptability in the given context):

(1) *Context*: Who bought the book?

(a) kitaab pranav=ne kharid-ii O[S]$_F$V
book.F Pranav.M=ERG buy-PFV.F
'Pranav bought the book.'

(b) pranav=ne kitaab kharid-ii [S]$_F$OV
Pranav.M=ERG book.F buy-PFV.F
'Pranav bought the book.' (elicited)

(2) *Context*: What did Pranav buy?

(a) pranav=ne kitaab kharid-ii S[O]FV
Pranav.M=ERG book.F buy-PFV.F
'Pranav bought a book.'

(b) #kitaab pranav=ne k^{h}arid-ii #[O]$_{F}$SV
book.F Pranav.M=ERG buy-PFV.F
'Pranav bought a book.' (elicited)

While a detailed discussion follows in Chapter 6 of this thesis, the examples in (1)-(2) give a snippet of context-related word order variation in Hindi and illustrate that contextual restrictions play a role in the order in which 'context-updating' and 'context-reflecting material' can be realised. These examples illustrate that basic SOV word order in Hindi, as well as the non-canonical word order OSV, are both acceptable as a response to *Who bought the book?* in (1) where *kitaab* 'book' presents the part of the utterance that is presupposed. This is usually called the *topic* – the element which provides the background against which an update in the shared context is made. *Pranav* constitutes material in focus that fills an informational gap in the hearer's knowledge with respect to the topic. The example in (2) shows that OSV is infelicitous as an answer to *What did Pranav buy?* and the canonical SOV is preferred, even though both express the same truth conditions. These examples show a tendency in Hindi for the clause-initial position to be occupied by material relative to which an information update is made (topic). The preverbal position, then, houses material that provides the update (focus), such as an answer to a *wh*- question (Butt & King, 1996; Kidwai, 2000).

Cross-linguistically, syntactic positions are often identified as focus-marking strategies among other (see Drubig & Schaffar, 2001 for an overview of focus constructions). The study of context-related factors on the linguistic expression of propositional content has received considerable attention and has been key for the explanation of a wide range of prosodic and

morphosyntactic phenomena across languages. Researchers have identified morphological markers, syntactic positions, pitch accent, case marking and agreement marking that indicate the information status of utterance material (Büring, 2009; Dalrymple & Nikolaeva, 2011; Güldemann, Zerbian, & Zimmermann, 2015; Zimmermann & Onea, 2011). To give an illustration of the array of structures that are observed cross-linguistically for the expression of focus, see (3)-(6) (see also Section 2.3 of this thesis). In Gùrùntùm, a West Chadic language, Hartmann and Zimmermann (2009) identify a morphological focus marker *a* that prefixes to the constituent in focus. We observe no changes in word order, whether the subject is focused (3)(b) or the object (4)(b). In contrast, in Gungbe, a Kwa language, focused constituents are positioned in the left periphery followed by the focus particle *wɛ̀*. In (5)(b) and (6)(b) the focused subject and object, respectively, are in the clause-initial position.

(3) Gùrùntùm: subject focus

(a) á kwá bá wúm kwálíngálá-ì
FOC who PROG chew colanut-DEF
'Who is chewing colanut?'

(b) á fúrmáyò bà wúm kwálíngálá
FOC fulani PROG chew colanut
'The fulani is chewing colanut.' (Hartmann & Zimmermann, 2009: 1342)

(4) Gùrùntùm: object focus

(a) á kā̃ã mài tí bà wúmì
FOC what REL 3SG PROG chew
'What is he chewing?'

(b) tí bà wúm-á kwálíngálá
3SG PROG chew-FOC colanut
'He is chewing colanut.' (Hartmann & Zimmermann, 2009: 1342)

(5) Gungbe: subject focus

(a) mɛ́nù wɛ̀ dà àsíàbá
who FOC marry Asiaba
'Who married Asiaba?'

(b) sɛ́sínú wɛ̀ dà àsíàbá
Sessinou FOC marry Asiaba
'Sessiniou married Asiaba.' (Aboh, 2007: 289)

(6) Gungbe: object focus

(a) mɛ́nù wɛ̀ sɛ́sínú dà
who FOC Sessinou marry
'Who did Sessinou marry?'

(b) àsíàbá wɛ̀ sɛ́sínú dà
Asiaba FOC Sessinou marry
'Sessinou married Asiaba.' (Aboh, 2007: 289)

While there is consensus among linguists that pragmatic factors play a role in the way utterances are structured, there is little agreement when it comes to the categories of information structure. There is an abundance of information-structural notions and definitions that have been proposed in the literature, such as *topic-comment* (Gundel, 1977), *ground-focus* (Vallduví, 1992), *given-new* (Prince, 1981), *theme-rheme* (Halliday, 1967), *topic-focus* (Sgall, Hajičová, & Panevová, 1986). Overall, despite terminological differences, the general consensus has been to differentiate between the 'informative' part of an utterance (the focus), which performs a context-updating function, and the acting-as-background context-reflecting part, relative to which the update is made (the topic), with empirical research concentrating on the identification of grammatical reflexes of these differing functions.

Often, an independent category of *contrast* is defined. Some argue that it combines with topics and foci (Molnár, 2002; Vallduví & Vilkuna, 1998), while others treat it as a focus-related interpretive effect due to pragmatic inference (Zimmermann, 2008, 2016). Some

researchers treat contrastiveness as a feature associated with a distinct subtype of focus. For example, É. Kiss (1998) argues that focus is to be split into two different types of focus: *identificational* and *information focus*, where each is associated with a distinct syntactic position, see (7). Crucially, the two types of focus differ when it comes to the meaning that they encode. Preverbal identificational focus is exhaustive (in **bold**; Mary picked a hat and nothing else), said to correspond to the meaning of an English *it*-cleft construction. Information focus in the postverbal position (in SMALL CAPS) conveys new information. For a critique, see Wedgwood, Pethő, and Cann (2006) and Wedgwood (2005).

(7) Hungarian: identificational and information focus

(a) Mari **egy** **kalapot** nezett ki maganak [exhaustive]
Mary a hat.ACC picked out herself.ACC
'It was **a hat** that Mary picked for herself.'

(b) Mari ki nezzett maganak EGY KALAPOT [non-exhaustive]
Mary out pick herself.ACC a hat.ACC
'Mary picked for herself A HAT.' (adapted from É. Kiss 1998: 248)

The question of whether there is cross-linguistically more than one type of foci, expressed via distinct linguistic forms to 'encode' distinct meanings, remains far from settled. Hindi can also be argued to show distinct grammatical means for indicating different types of focus. In addition to a preverbal focus position (as we saw in (1)(a) above), it also employs a less studied marker *hii* described as "an emphatic marker, generally with a sense of exclusion" (Shapiro, 1989: 239) or an "exclusive contrastive focus" marker (Sharma, 1999: 3). An example is given in (8) (transcription, glosses and translation are kept as in the original source). As we see from the translation, the intuition is that the interpretation of an utterance containing *hii* resembles that of an English *it*-cleft construction and contributes an *only*-like meaning:

(8) rad^{h}aa=ne=hii bacchon=ko kahanii sunaayii
radha=ERG=EXCL FOC children=ACC story make-hear-PFV.F
'It was (only) Radha who told the children a story.' (Sharma, 1999: 3)

The precise contribution of *hii* in Hindi, however, remains very hard to pinpoint (see the discussion in Section 2.2.2).

A further point of disagreement among scholars is the place of information structure in grammar (see Erteschik-Shir (2007) who provides a comprehensive overview and critical discussion of various theoretical approaches). For example, some take a purely syntactic perspective arguing for peripheral structural positions where topic and focus occupy designated structural positions (É. Kiss, 1995, 1998; Rizzi, 1997). Other theoretical approaches assume a grammar architecture with multiple levels of representation which allows to define a parallel level of information structure (King, 1997; Vallduví, 1992; Vallduví & Engdahl, 1996). What is not clear is whether it is indeed needed to define information structure, and associated notions such as topic and focus, as part of grammar and how successful are such attempts at capturing the observable cross-linguistic variation (Matić, 2015).

An alternative approach is propagated by Matić and Wedgwood (2013) who doubt that a cross-linguistically valid category of focus can be defined. In their own words, "so-called focus constructions in different languages may be underlyingly quite different things, though they show overlapping interpretive effects" (2013: 132). They argue for focus to be understood as a descriptive tool for the identification of structural patterns across languages that yield comparable pragmatic effects. They call for caution when it comes to identifying so-called focus-marking strategies by showing that in a range of languages (morpho-)syntactic strategies said to 'mark' focus, in fact, perform other diverse functions. Data from Somali, Quechua and Even shows that structures analysed as expressing focus, also relate to other aspects of grammar in each of the languages such as realis mood, evidentiality, attaching to discourse connectors,

among other traditionally non-focus uses. This suggests that the identified structures achieve comparable pragmatic effects but are not to be identified as focus constructions, i.e. as 'dedicated' for the expression of focus, as they perform diverse functions.

Similarly, the Hindi examples in (9)-(10) below (repeated from (1)-(2)) pose problems for analyses that identify strict correspondence between syntactic positions and pragmatic functions such as focus and topic. The focused subject *pranav=ne* is acceptable in both the immediately preverbal position (9)(a), as well as clause-initially (9)(b). This is a challenge for theoretical approaches that assume 'dedicated' syntactic positions for the expressions of focus. The question that arises is, if there is a 'dedicated' strategy for the expression of focus, why is a focused subject only optionally 'marked' by occupying the preverbal position.

(9) *Context*: Who bought the book?

(a) kitaab pranav=ne k^{h}arid-ii O[S]$_{F}$V
book.F Pranav.M=ERG buy-PFV.F
'Pranav bought the book.'

(b) pranav=ne kitaab k^{h}arid-ii [S]$_{F}$OV
Pranav.M=ERG book.F buy-PFV.F
'Pranav bought the book.' (elicited)

(10) *Context*: What did Pranav buy?

(a) pranav=ne kitaab k^{h}arid-ii S[O]FV
Pranav.M=ERG book.F buy-PFV.F
'Pranav bought a book.'

(b) #kitaab pranav=ne k^{h}arid-ii #[O]$_{F}$SV
book.F Pranav.M=ERG buy-PFV.F
'Pranav bought a book.' (elicited)

The examples in (9)-(10) highlight a further problem in need of explanation, namely a subject-object asymmetry with respect to focus marking and linear positioning. While the subject can

appear both preverbally and clause-initially when focused, as in (9), the focused object is much more restricted. Objects are realised in initial position, as in (9)(a), when acting as the background against which context-updating material is realised. Otherwise, they are strictly realised in the immediately preverbal position as an answer to a *wh*- question, as shown in (10)(a)(b).

Cross-linguistically, these observations are not surprising. Optional focus-marking as well as subject-object asymmetries have been previously discussed for West African languages (see, for example, Zimmermann & Onea, 2011). This is where the type of analysis advocated by Matić and Wedgwood might be able to lead us to new insights. In my understanding of their argumentation, the difference between treating focus as a universally available category and focus as a "heuristic tool" (2013: 158) is an important one as it results in fundamental differences in how linguistic analysis is approached. Instead of looking for realisations of a predefined category said to manifest in specific contexts, efforts are to be concentrated on *how* comparable context-related interpretive effects are achieved across languages. This suggests a shift in perspective: from an investigation of how focus is 'encoded' or 'marked' to how focus 'meanings' arise as a result of the interaction between context and grammar. Such an approach necessitates a usage-based grammar architecture that takes a procedural view on the interpretation process. This would allow for focus effects to be modelled as arising out of the interaction of grammar mechanisms and contextual information in the process of utterance interpretation.

Having outlined in brief the wider discussion in the literature on focus, this leads us to the empirical focus and objectives of this thesis. In what follows, I give a brief background on Hindi (Section 1.2), the language under investigation, and I introduce the objectives, theoretical

approach and type of analysis pursued (Section 1.3), followed by a discussion of the data collection methods used (Section 1.4).

1.2 Brief overview of Hindi clause structure

Hindi is an Indo-Aryan language widely spoken in the north of the Indian subcontinent. It is structurally very closely related to Urdu and thus a lot of the data and analyses discussed in this thesis would apply to both. In fact, researchers commonly use 'Hindi-Urdu' or 'Hindi/Urdu' to refer to a common spoken variety and linguistic structures shared by both (see, for example, Bhatt & Embrick, 2017; Butt, 2014; Davison, 2015; Dayal, 2017b; Kidwai, 2000; Manetta, 2010). I will use 'Hindi' when presenting data collected for this thesis as this is how the data was discussed with my language consultants during my time in Delhi. I use the term 'Hindi-Urdu' when discussing examples from published works that have used the term.

This thesis explores nominal interpretation in Hindi, as well as the role of case marking and verbal morphology in the interpretation process, before delving into pragmatically driven word order variation in Hindi. Here I provide a brief introduction while a more detailed discussion follows in subsequent chapters of this thesis.

1.2.1 Case marking and agreement

Butt and King (2004) provide a detailed overview of Hindi/Urdu case markers. They identify seven cases, as shown in Table 2, each with a distinct morphological realisation. Out of all, only the genitive marker =*k*- inflects according to the gender and number of the head. Here I will provide a brief overview of null marking, ergative and accusative/dative as these will be discussed in more detail in subsequent chapters of the thesis. For an overview of the uses of

the instrumental *se*, genitive *k-* and locative *meN, par* and *tak,* the reader is directed to Butt & King (2004).

Table 2 Hindi/Urdu case clitics based on Butt and King (2004)

Case clitic	Case label	Grammatical function
Ø	nominative	subject/object
ne	ergative	subject
ko	accusative dative	object subject/indirect object
se	instrumental	subject/oblique/adjunct
k-	genitive	subject (infinitives) specifier
meN/par/tak/Ø	locative	oblique/adjunct

In Butt and King's (2004) analysis, nominative case is indicated with the lack of an overt case marker (null marking). Nominative null marking is observed with both subjects and objects. In fact, a clause may contain more than one nominative arguments, as shown in (11). In this thesis I will refer to nominals with no overt case marker as 'unmarked'. In (11) both the subject *zoyaa* and the object *ak^{h}baar* are unmarked, i.e. they are realised without an overt morphological marker indicating case. The progressive auxiliary *rahii* and the tense-carrying auxiliary *hai* show agreement with the unmarked subject *zoyaa* in gender and number, respectively.

(11) zoyaa ak^{h}baar paR^{h} rah-ii hai
Zoya.F newspaper.M read PROG-F be.PRS.3SG
'Zoya is reading a/the newspaper.' (elicited)

The ergative marker *=ne* is employed in the perfective. Perfective transitive subjects carry the ergative marker *=ne,* while intransitive subjects are generally unmarked. These patterns are illustrated in (12)-(13).

(12) raam=ne kitaab paR^{h}-ii t^{h}-ii
Ram.M=ERG book.F read-PFV.F be.PST-F
'Ram had read a/the book.' (elicited)

(13) miiraa dillii gayii t^{h}-ii
Mira.F Delhi go.PFV.F be.PST-F
'Mira had gone to Delhi.' (elicited)

In (12), the subject is obligatorily marked with the ergative *=ne* and the perfective verb and past tense auxiliary show agreement with the unmarked feminine object *kitaab* 'book'. Intransitive subjects in the perfective are (generally) unmarked, as in (13). The perfective verb *gayii* and past tense auxiliary *t^{h}ii* show agreement with the unmarked feminine subject *miiraa*.

Hindi verbs show agreement only with unmarked NPs, as shown so far with the examples in (11)-(13). When 'core' arguments carry an overt case marker, then the verb defaults to third person, singular, masculine agreement (the *-aa* suffix). Some speakers allow the realisation of *=ne* with a small set of intransitive verbs that describe body-related functions (see Bashir, 1999; Davison, 1999). In (14) the subject *laRkii* 'girl' is optionally marked with *=ne,* resulting in purposeful readings (Butt, 2017; Butt & King, 2004), or more generally – to increased agenthood readings. In this case, the verb shows default agreement. In (14)(b) the perfective verb agrees with the feminine unmarked subject.

(14) Optional *=ne*

(a) laRkii=ne k^{h}aaNs-aa
girl.F=ERG cough-PFV.M.SG
'The girl coughed.'

(b) laRkii k^{h}aaNs-ii
girl.F cough-PFV.F
'The girl coughed.' (Saleemi, 2003: 145)

The *=ko* marker is employed for both accusative and dative uses. In transitive clauses objects high in animacy and/or specificity are marked with *=ko* (Aissen, 2003; Butt, 1993; de

Hoop & Narasimhan, 2005; Montaut, 2018). This is shown in (15) where *priyaa* obligatorily carries the *=ko* marker (in **bold**). With objects that are low in animacy the *=ko* marker is optional. Its realisation though coincides with specific readings as in (16) (as opposed to unmarked objects which allow both specific and non-specific readings, as shown in (11) and (12) above). In both (15) and (16) the perfective verb shows default agreement as both core arguments carry a case marker.

(15) miiraa=ne priyaa**=ko** mar-aa t^{h}-aa
Mira.F=ERG Priya.F=ACC hit-PFV.M.SG be.PST-M.SG
'Mira had hit Priya.' (elicited)

(16) raam=ne kitaab**=ko** paR^{h}-aa t^{h}-aa
Ram.M=ERG book.F=ACC read-PFV.M be.PST-M.SG
'Ram had read the book.' (elicited)

The marker *=ko* can also optionally be realised in passive constructions. Passive constructions in Hindi/Urdu are formed with the main verb in root form followed by the passive auxiliary *jaa-* 'go' which inflects for tense-aspect and carries agreement morphology. In (17)(a)[2] *=ko* is realised at the end of the conjoined NP in which each noun is in an oblique form (*-oN*) indicating that a case marker or postposition follows[3]. Similarly, the oblique form is observed in (17)(b) (*gaayoN* 'cows') and (17)(c) (*rassiyoN* 'ropes') as well. The examples show that *=ko* can be retained with both animates (17)(b) and inanimates (17)(c) in the passive. In all examples in (17) the passive auxiliary shows default agreement in third person, singular, masculine as the logical object carries the marker *=ko*.

[2] The extracts are from a text on the Assamese harvest festivals Bihu, taken from the Emille Hindi Webnews corpus (cqpweb.lancs.ac.uk).
[3] Note that the oblique form (*-oN*) surfaces in the plural with these nouns. In the singular, no oblique morphology would be observed. See Butt and King (2004) for a detailed overview of oblique forms in Hindi/Urdu.

(17) Use of *=ko* in passive constructions

(a) siiNgoN aur k^{h}uroN**=ko** vib^{h}inna raNgoN=se raNgaa
horn.OBL.PL and hoof.OBL.PL=ACC different colour.OBL.PL=with paint

jaa-t-aa hai
PASS-IMPF-M.SG be.PRS.3SG
'The horns and hooves are painted with different colours.'

(b) p^{h}ir in gaayoN**=ko** puure gaauN=meN g^{h}umaa-yaa
then 3PL.PROX.OBL cow.OBL.PL=ACC whole village=in walk.around-PFV.M.SG

jaa-t-aa hai
PASS-IMPFV-M.SG be.PRS.3SG
'Then, the cows are walked around the whole village.'

(c) is=ke baad un=kii puraan-ii rassiyoN**=ko**
3SG.PROX.OBL=after 3PL.DIST.OBL=GEN.F old-F rope.OBL.PL=ACC

kaaT di-yaa jaa-t-aa hai
cut give-PFV.M.SG PASS-IMPFV-M.SG be.PRS.3SG
'After this their old ropes are cut.' (Emille Hindi Webnews Corpus; ehinweb002)

The *=ko* marker surfaces obligatorily with recipients. This is shown in the active voice example in (18) and in the passive voice in (19). In (18) the recipient of *pyaar* 'love' in the first clause is *is bachche* 'this child' (in oblique form) followed by *=ko.* In the second clause, the object *pyaar* is not repeated and the indirect object recipient *apne pehle bachche* 'self's first child' (in oblique form) is marked with *=ko.* In the passive voice example in (19) the recipient of the award, Shahrukh Khan, is marked with *=ko.*

(18) … is bachche**=ko** bʰii utnaa hii pyaar duuNgii
3SG.PROX.OBL child.M.OBL=DAT also that.much.M EMPH love.M give.FUT.1SG.F

jitnaa maiN=ne apne pehle bachche**=ko** diyaa
as.much.M 1SG=ERG self's.OBL.M first.M.OBL child.M.OBL=DAT give.PFV.SG.M
'… I will give this child as well as much love as I gave my first child.' (*lit.* 'To this child also I will give that much love as much I gave to my first child.') (Emille Hindi Webnews Corpus; ehinweb5e2)

(19) … behatariin adaakaar=kaa awɔrD shaahrukʰ kʰaan=**ko**
best actor=GEN.M.SG award.M Shahrukh Khan=DAT

diyaa gayaa tʰaa
give.PFV.M.SG PASS.PFV.M.SG be.PST.M.SG
'.. the best actor award was given to Shahrukh Khan.' (Emille Hindi Spoken Corpus; ehinsp01f)

In addition, *=ko* also surfaces with experiencer subjects. This is illustrated in (20) where *har umra=ke logoN=ko* 'people of all ages' can be thought of as the experiencer or – metaphorically – as the endpoint of *pasaNd* 'liking'. In this case a complex predicate is formed made of *pasaNd* 'liking' and the verb *aa-* 'come' which is inflected for tense-aspect and shows agreement with the theme *giit* 'song'[4].

(20) mujʰe ummiid hai ki har umra=ke logoN=**ko**
1SG.DAT hope be.PRS.SG that every age=GEN.M.PL people.OBL.PL=DAT

is kaiseT=ke giit pasaNd aa-yeNge
3SG.PROX.OBL cassette=GEN.M.PL song liking come-FUT.M.PL
'I hope that people of all ages will like this cassette's songs.' (Emille Hindi Webnews Corpus; ehinweb001)

The *=ko* marker, however, also surfaces on non 'core' arguments, such as days of the week or the month, as in (21). In this thesis I will only be concerned with argument uses of *=ko*. For a detailed overview of the many uses of *=ko* in Hindi/Urdu, see Ahmed (2006).

[4] The noun *giit* 'song' can be either singular or plural. It is agreement on the verb as well as the inflected genitive marker *=ke* (in *kaiseT=ke giit* 'casette's songs') that show that a plural use is intended.

(21) ye puraskaar berlin=meN 19 sitambar**=ko** diyaa jaa-egaa
3SG.PROX award.M Berlin=in 19 September=KO give.PFV.M.SG pass-FUT.3SG.M
'This award will be given in Berlin on the 19th of September.' (Emille Hindi Webnews Corpus; ehinweb167)

This brief overview has shown that Hindi and closely related Urdu employ a complex case marking system which interacts with aspect and agreement, and also relates to animacy and specificity. Chapters 4 and 5 revisit these observations and make first steps towards modelling nominal interpretation and the contribution of the *=ne* and *=ko* case markers. Next, I give a short introduction to word order variation and information structure.

1.2.2 Word order and information structure

Hindi is an SOV language that allows a great degree of word order variation subject to information structural factors. In fact, all possible permutations can be found when it comes to subject and object ordering, as shown in (22). The 'canonical' SOV word order is shown in (22)(a). The rest of the examples in (22) show possible 'non-canonical' word orders variants. All examples would yield the same truth-conditional content but are felicitous in different contexts.

(22) Word order variation: S and O ordering

(a) miiraa=ne kelaa k^{h}aa-yaa [SOV]
Mira.F=ERG banana.M eat-PFV.SG.M
'Mira ate a/the banana.' (elicited)

(b) kelaa	miiraa=ne	k^{h}aa-yaa	[OSV]
(c) miiraa=ne	k^{h}aa-yaa	kelaa	[SVO]
(d) kelaa	k^{h}aa-yaa	miiraa=ne	[OVS]
(e) k^{h}aa-yaa	miiraa=ne	kelaa	[VSO]
(f) k^{h}aa-yaa	kelaa	miiraa=ne	[VOS]

Generally, it is accepted that the preverbal position houses material in focus, and the clause initial position is occupied by topics (Butt & King, 1996; Kidwai, 1999, 2000; Montaut, 2015). This means that the non-canonical OSV word order in (22)(b) would be felicitous as an answer to a question such as '*Who ate the banana?'.* The initial *kelaa* 'banana' would be the topic 'about' which the rest of the utterance provides information. However, as discussed in Section 1.1 there is by no means a strict requirement that material in focus can be realised only in this position. Corrections and parallel structures, for example, show a lot of variation. While an object in focus is strongly preferred to be realised in the preverbal position, a correctively focused object can be realised initially as in (23) as long as it is associated with prosodic prominence (see also the discussion in Dayal, 2008, as well as Chapter 4 of this thesis):

(23) KITAAB miiraa paD^{h} rah-ii t^{h}-ii ak^{h}baar nahii
book.F Mira.F read PROG-F be.PST-F newspaper not
'Mira was reading a BOOK, not a newspaper.' (elicited)

Similarly, a single discourse function associated with the postverbal position cannot be easily pinpointed (Gambhir, 1981). Butt and King (1996) argue that the postverbal position houses backgrounded material. That is, 'old' or 'known' material that facilitates the understanding of the 'new', focused material (1996: 4). Gambhir (1981: 319) notes that 'new' material can be postposed to the postverbal position. She describes this as an 'announcement style' observed

in TV and radio. An example with a transitive clause in which the subject is delayed to the postverbal position is given in (24).

(24) aaj=kaa programaam pesh kar rah-e haiN **ek** **bahut**
today=GEN.SG.M programme.M present do PROG-PL.M be.PRS.PL one very

mashoor kalaakaar
famous artist.M
'A very famous artist is presenting today's programme.' (Dayal, 2003: 89; adapted glossing)

The variation in how parallel constructions can be organised has received little attention. In (25) in B's response we observe the postverbal realisation of the focused object *barfii* 'barfi'[5].

(25) Parallel structure

A: bataa-o kis=ne kya kya k^{h}aa-yaa
tell-IMP who.OBL=ERG what what eat-PFV.M
'Tell me who ate what.'

B: maiN bataa-t-ii huuN raam=ne **halvaa** dev=ne **kek**
1SG tell-IMPF-F be.PRS.1SG Ram.M=ERG halva.M Dev.M=ERG cake.M

aur baabuu=ne k^{h}aa-ii hai **barfii**
and Babu.M=ERG eat-PFV.F be.PRS.3SG **barfi.F**
'I'll tell you. Ram – halva, Dev – cake, and Babu ate barfi.' (Gambhir, 1981: 91; adapted)

Further, VOS and VSO word orders (as in (22)(e) and (22)(f) above) pose a significant challenge for most, if not all, theoretical approaches as these show that multiple phrases can be realised to the right of the verb. Simpson and Choudhury (2015) give (26) as an example. In B's response the recipient and the agent, both constituting 'new' material, are realised postverbally.

[5] Barfi is a sweet made from condensed milk.

(26) A: yeh zewar to baRe sundar haiN
3.PROX jewel.M TOP very beautiful be.PRS.PL
'These jewels are very beautiful.'

kis=ne kis=ko diyaa
who.OBL=ERG who.OBL=ACC/DAT give.PFV.SG.M
'Who gave them to whom?'

B: yeh zewar diye haiN **giitaa=ko** **raam=ne**
3.PROX jewel.M give.PFV.PL.M be.PRS.PL Gita.F=ACC/DAT Ram.M=ERG
'Ram gave these jewels to Gita.' (Simpson & Choudhury, 2015; transcription and glosses adapted)

Wh- phrases are also observed to surface in different syntactic positions. For example, a subject *wh*-phrase can appear in either the initial or preverbal position, as illustrated in (27). However, the default position for *wh-* phrases is argued to be the immediately preverbal one (Butt, 2014; Butt & King, 1996; Féry, Pandey, & Kentner, 2016; Kidwai, 1999, 2000). *Wh-* phrases can also be realised postverbally as in (28) as well as within the verbal complex, as shown in (29), giving rise to echo and rhetorical question readings (Bhatt, 2003; Bhatt & Dayal, 2014; Butt, 2014; Butt, Farhat, & Bögel, 2016). Butt (2014) argues that a postverbal *wh-* phrase is realised in a secondary focus position with primary focus being on the verb.

(27) Subject *wh-*

(a) kis=ne mira=ko mar-aa
who.OBL=ERG mira.F=ACC hit-PFV.M.SG
'Who hit Mira?'

(b) mira=ko kis=ne mar-aa
mira.F=ACC who.OBL=ERG hit-PFV.M.SG
'Who hit Mira?' (elicited)

(28) Postverbal *wh-*

(a) raam=ne kitaab dii kis=ko
Ram=ERG book.F give.PFV.F who=DAT
'Ram gave a book to WHO?'(Bhatt, 2003: 10; transcription and glosses adapted)

(b) us=ne tumheN diyaa kyaa
3SG=ERG 2SG.DAT give.PFV.M.SG what
'What did he ever give you?' (Bhatt, 2003: 10; transcription and glosses adapted)

(29) *Wh-* within verbal complex
sitaa=ne d^{h}yan=se dek^{h}-aa kis=ko t^{h}aa
Sita.F=ERG carefully see-PFV.M.SG who.OBL=ACC be.PST.M.SG
'Who had Sita (really) looked at carefully?' (Butt, 2014: 6)

A great degree of variation is also observed when it comes to the ordering of existential and copular constructions. While (30)(a) can be uttered in an out-of-the-blue context yielding an existential reading, (30)(b) requires a context in which the initial *kitaab* 'book' is the topic, i.e. it is the entity 'about' which the rest of the utterance provides information (hence, the specific reading).

(30) (a) mez=pe kitaab hai
table=on book be.PRS.3SG
'There is a book on the table.' (elicited)

(b) kitaab mez=pe hai
book table=on be.PRS.3SG
'The book is on the table.' (elicited)

The examples in (31) and (32) show genitive modifiers (in **bold**) postposed away from the nominal head to the post-copular position. Both examples come from the Emille Hindi Spoken Corpus which consists of transcripts of radio programmes (see Section 1.4 on data collection).

(31) ek piktʃar t^{h}ii **sannii Deol=kii**
one film.F be.PST.F Sunny Deol=GEN.F
'There was a Sunny Deol film.' (*lit.* 'There was one film, Sunny Deol's.') (Emille Hindi Spoken Corpus; ehinsp047)

(32) yeh aavaaz t^{h}ii **lataa maNgeshkar=kii**
3.PROX voice.F be.PST.F Lata Mangeshkar=GEN.F
'This voice was Lata Mangeshkar's.' (Emille Spoken Corpus; ehinsp00a)

In (31), the speaker introduces a discourse referent with *ek picture* 'one film' (as I will argue in Chapter 4, the use of the numeral *ek* 'one' is the go-to strategy for the introduction of new referents with the aim of picking them up subsequently). The post-copular genitive modifier *sannii Deol=kii* provides more information about the new referent, i.e. that it is a Sunny Deol film. In (32), we see an example of late realisation of the informative part of an utterance to the right of the tense-carrying copula. The copular construction in (32) and the transitive clause in (24) above both illustrate the delay of information to the right of tense information which Gambhir (1981) describes as the 'announcement style'.

This short overview has shown that Hindi exhibits a high degree of word order variation. Information-structural factors are observed when it comes to the ordering of arguments at the clausal level, the organization of copular constructions, the ordering of nominal heads and modifiers, as well as splitting the otherwise rigidly ordered verbal complex. The challenge that Hindi poses is not only the high degree of free word order but also the diversity of functions that different syntactic positions can perform. Having given a brief introduction to Hindi clause structure, this brings us to the aims and objectives of this thesis.

1.3 Aims and objectives

This thesis develops a usage-based approach to analysing Hindi clause structure, drawing on the tools of the Dynamic Syntax (DS) formalism (Cann et al., 2005; Kempson et al., 2001; Marten, 2002), at the heart of which lies the idea that syntactic explanations emerge naturally once the dynamics of the parsing and production process is taken as the basis for linguistic analysis. Most formal approaches to the study of language assume a clear division between what it means to know a language (competence) and language use (performance). In contrast,

DS narrows this divide by proposing a model which reflects the parsing/production process as the stepwise accumulation of semantic information in a time-linear, word-by-word fashion.

This thesis is a first attempt at capturing particularities of the Hindi clause from a theoretical perspective that takes the stepwise, word-by-word process in which meaning is accumulated as the basis for explaining linguistic phenomena. Employing DS concepts of underspecification and update, it takes first steps towards modelling Hindi nominal interpretation and the contribution of case and verbal morphology in the parsing process, before delving into information structural phenomena.

1.3.1 Dynamic approach to Hindi clause structure

The discussion in this thesis builds on previous work within the DS framework where case markers are analysed as indicators of NP boundaries and carry information about the argument's role in the gradually unfolding propositional structure well before the parse of the verb (Kempson & Kiaer, 2009a, 2009b). Chapter 4 proposes that in Hindi, and closely related Urdu, the ergative marker =*ne* informs the parser that the structure under construction is a finite one (i.e. it is fixed in the flow of time) and identifies the most active participant in the event. The accusative/dative marker =*ko* identifies a non-agent argument that is affected as a result of the event, i.e. they are on the receiving end of an agent's actions (patients) or at the receiving end of a transfer event (recipients). Equally, =*ko* marked arguments can be thought of as metaphorical endpoints; they are the arguments towards which some action is oriented (see also Ahmed, 2006).

Formally, the case markers' contribution is modelled in terms of lexical entries that contain directions for the parser on how the expression fits within the emerging propositional

structure. Case markers build a partial argument structure ahead of parsing the verb.[6] In this sense their role is truly constructive, echoing Nordlinger's (1998) LFG approach. Under the proposed analysis, unmarked NPs (commonly analysed as nominative in other approaches) are associated with structural uncertainty which is resolved with the parse of the verb. Finally, the parse of the inflected verb unfolds the full propositional structure which allows resolving any outstanding structural underspecification. In a head-final language such as Hindi, the parse of tense information is what signals having reached a propositional boundary and triggers the accumulation of the truth-conditional content of the utterance.

A consequence of treating the markers *=ne* and *=ko* as indicators of NP boundaries is that we now have an intuitive way of explaining specificity effects associated with the use of the markers. The case markers signal to the parser that all semantic information necessary for the compilation of the NP has already been provided ahead of parsing the verb. The effect is that the entity denoted by the noun escapes evaluation with respect to the local predication, and instead a search in the context is triggered (hence, the strong expectation for specific readings of bare, case-marked nominals). As a bonus, the *case-markers-as-compilators* approach rightly predicts that the realisation of modifiers (e.g. adjectives or genitive modifiers) to the right of a case-marked nominal head is strictly disallowed (Fanselow & Féry, 2006; Sulger, 2016).

1.3.2 Dynamic approach to focus

The major focus of this thesis is on deviations from Hindi's 'basic' or 'neutral' word order (SOV) and the contexts in which these occur. It explores the pragmatic motivations for deviating from Hindi's canonical word order and, in particular, the syntactic positions that can 'house' material in focus. The major argument made is that a parsing-based approach is to be

[6] Though a fully worked out analysis of the incremental building of event structure is pending.

pursued for better understanding information-structural phenomena, i.e. an approach that reflects the procedural, word-by-word manner in which language is processed relative to the context.

The analyses proposed here diverge from most previous formal work on Hindi, and information structure in general, in several ways. While most theoretical approaches assume static representations of clause structure, the syntactic process in DS is dynamic and is formally represented as the gradual unfolding of structured representations of meaning as each lexical item is processed relative to the context in which uttered. Importantly, the context 'grows' with the parse of each word and is understood as a track-record of retrievable content and parsing actions (Kempson, Cann, Eshghi, Gregoromichelaki, & Purver, 2015; Kempson, Gregoromichelaki, Eshghi, & Hough, 2019). This allows modelling information structural effects as arising within the interpretation process itself rather than being encoded through dedicated syntactic positions.

A further difference is that notions such as topic and focus do not have formal significance. The argument made is similar in spirit to what Matić and Wedgwood (2013) propose (as discussed in Section 1.1 above). Topic and focus are understood as pragmatic notions that describe the relationship utterance material holds with respect to the context but have no role in the formal analysis itself. Their expression involves the manipulation of universally available grammatical mechanisms in interaction with language-specific lexical instructions and contextual information.

The argument developed here is conceptually in line with influential semantic approaches to the study of focus such as Rooth's (1985, 1992) *alternative semantics* and Lambrecht's (1994) assertion-based approach (see Chapter 2 for a detailed discussion on these). The expression of focus is understood as the act of making an informational update

relative to some context. For example, answers to *wh*- questions provide a value to a contextually-available open proposition (i.e. a proposition with a 'missing' value), corrections replace some value and topic-focus sequences involve an 'update' relative to some partial structure in the immediate linguistic context (the topic). The analysis builds on previous work on focus but adds a dynamic twist: it models the stepwise process in which an open proposition is derived and the point in the interpretation process in which focal material provides an 'update' to yield a fully complete truth-conditional formula.

Having outlined the type of analysis that is developed here, the empirical focus and motivations behind this thesis, I proceed to present the particular research methods used for data collection, as well as the methodological challenges that arose with respect to collecting the type of empirical data I consider most relevant and useful for informing and testing the conceptual claims developed in this thesis.

1.4 Data collection and methodology

Devising research methods for the investigation of information structure in individual languages that allow cross-linguistic comparison is a challenge, especially considering the wide array of constructions and associated meanings identified cross-linguistically to relate to the expression of focus (see, for example, Drubig & Schaffar, 2001 for an overview of focus constructions). First, there is a great deal of variation both across as well as within languages when it comes to the parts of grammar that have been shown to be sensitive to information structural factors: morphological markers, word order, pitch accent, case-marking, agreement (Büring, 2009; Dalrymple & Nikolaeva, 2011; Güldemann et al., 2015; Zimmermann & Onea, 2011). Second, there is variation across languages when it comes to the interpretive effects that

different linguistic structures are said to give rise to and the contextual restrictions on their acceptability. This, in turn, has led to an overload of proposed terms and definitions of focus and different focus types (see Chapter 2). Third, while languages show clear tendencies for certain grammatical strategies to be used in specific contexts, there is no such obligatory correlation (Hartmann & Zimmermann, 2009; Molnár & Järventausta, 2003; Zimmermann & Onea, 2011). For example, while a certain linguistic form is observed to surface in specific contexts, it is not the case that it surfaces obligatorily under the right conditions. This is especially true for the so-called contrastive focus marking noted to surface in 'marked' contexts; however, the right context alone does not guarantee its realisation. As Matić and Wedgwood (2013) point out, the use of a certain grammatical strategy may indeed be a reflex of information-structural properties such as focus but may not be reserved solely for its expression (see Section 2.2). Such factors pose methodological challenges when it comes to data collection but these are also empirical observations that need to be theoretically addressed. I return to these observations in more detail in Chapter 2, the immediate concern here being the discussion on data collection methods.

1.4.1 Data and participants

Most of the data in this thesis comes from two research trips to Delhi during which I recorded spontaneous, as well as semi-spontaneous speech using production tasks with the help of visual stimuli. Other sources of data include elicitation sessions on grammaticality judgments, the monolingual EMILLE[7] written and spoken Hindi corpora, as well as extracts from online

[7] Information about the EMILLE/CIIL Corpus (ELRA-W0037) can be found on the following website: https://www.lancaster.ac.uk/fass/projects/corpus/emille/ (last accessed April 2018).

newspaper articles and published novels (see Appendix A for data sources). The different methods for data collection used are discussed in detail in Section 1.4.2 below.

The data from recordings of spontaneous and semi-spontaneous speech, as well as constructed examples from elicitation sessions comes from 15 native speakers of Hindi, all students at Delhi University in their twenties. Consultants were questioned on their linguistic background. All are native Hindi speakers who were brought up speaking only Hindi at home, living in Hindi-speaking areas. All consultants are from Delhi or have moved to Delhi for studies from cities in Uttar Pradesh (Lucknow, Ghaziabad, Kanpur, Bulandshahar, Bareilly, Bijnor).

1.4.2 'Looking' for focus

The empirical investigation and description of information structure in individual languages has largely relied on the identification of grammatical reflexes of contextual factors on the formal organization of utterances, and more precisely – on the identification of correspondences between particular linguistic forms and pragmatic functions. Generally, there are two main approaches that can be followed: a form-based approach and a function-based approach (Skopeteas, 2012), where each informs the application of different data collection methods. For this thesis, in line with Skopeteas (2012), complementary data collection methods were used: direct elicitations, production experiments, recordings of naturalistic speech, as well as written texts.

A function-based approach to data collection was applied with the help of production tasks designed to 'control' the context. Such an approach necessitates a clear definition of the functions under investigation. For data collection purposes I followed a very general definition of focus: material is *focused* or *in focus* if it leads to an informational update to the

interlocutors' shared context. The use of focus as a cover term for context-update effects is conceptually in line with influential semantic approaches such as Rooth's (1985, 1992) *alternative semantics*. It subsumes different pragmatic uses of focus that relate to the communicative goals of interlocutors (Krifka, 2007, 2008). Pragmatic focus types are defined on the basis of the context in which the utterance provides an information update (see Dik et al., 1981; Zimmermann & Onea, 2011). These include answers to *wh*- questions, corrections, confirmations, selections and parallels – all understood as a speaker's move towards an information update relative to the context.

For production experiments I followed the *Questionnaire on Information Structure* (QUIS; Skopeteas et al., 2006) designed as part of project D2 *Typology of Information Structure* within the Sonderforschungsbereich (SFB) 632 at the University of Potsdam and Humboldt University Berlin. The questionnaire contains experimental tasks designed to give the researcher control over the context to elicit utterances with different information-structural properties. QUIS is a useful tool and manual for the identification and description of information structural phenomena. There are tasks for the elicitation of all new sentences, tasks which trigger utterances containing different types of focus or focus on different parts of NP constituents. However, results of production tasks performed with just one participant which require the active role of the researcher are to be treated with caution. In my view, data gathered from such tasks are by no means sufficient for making strong claims about the relationship between contextual factors and the formal organization of utterances. First, elicited utterances in most experimental tasks are only semi-spontaneous. For example, in most tasks answers to *wh*- questions are collected by presenting the participant with a picture and asking them to reply with a full sentence even when a single-word or fragmented response would be more natural. Second, the researcher might influence the speaker's choice of linguistic expression (after all,

the researcher is the one who has prepared the picture materials and is presenting them to the speaker). The researcher may be treated as an addressee and/or may influence what is assumed by the speaker to be in the common ground (El Zarka & Heidinger, 2014; van der Wal, 2014). Such tasks also risk a 'tunnel vision' as their aim is to elicit a predefined pragmatic function in a carefully crafted context. While a linguistic form is used to perform a specific context-related function, this does not guarantee that it does not surface in other contexts as well. This is what Matić and Wedgwood (2013) warn against, as discussed in Section 1.1.

In my experience, tasks that involved two participants yielded much better results and allowed collecting more natural and varied data. In fact, I observed more 'marked' constructions in collaborative tasks that involved two participants than in single-participant production tasks, showing the interactive nature of information structural phenomena and their interrelatedness with speakers' communicative goals. For example, in collaborative tasks a heavier use of emphatic particles was observed compared to single-consultant tasks (such particles, however, will not be analysed in this thesis as more empirical work is needed). As an illustration, an extract from a 'map task' is given in (33). For this task two participants, A and B, were presented with almost identical maps (maps were designed by me, inspired by the HCRC Map Task Corpus[8]). Participant A had to guide participant B from a start to a finish point without looking at each other's maps.

(33) *Map task*: A and B hold almost identical maps. A is giving directions to B.

A:	tuj^{h}e	vahaaN=se	start	kar-naa	hai	jahaaN=pe	sirf	ek	peR	ho
	2SG.DAT	there=from	start	do-INF	be.PRS.3SG	where=on	only	one	tree	be

'You must start from there where there should be only one tree.'

[8] For information on the HCRC Map Task Corpus, see http://groups.inf.ed.ac.uk/maptask/index.html (last accessed 25 July 2019)

B: ek peR
one tree
'One tree?'

A: haaN ek peR
yes one tree
'Yes, one tree.'

B: vo **to** nahiiN hai
3SG.DIST TOP NEG be.PRS.3SG
'That, there isn't.'

ek peR
one tree
'One tree?'

A: ek **hii** peR hai
one EMPH tree be.PRS.3SG
'There's only one tree.'

B: haaN haaN hai
yes yes be.PRS.3SG
'Yes, yes, there is.'

This extract shows the use of the emphatic particle *hii* and the so-called topic marker *to* (both in **bold**) uttered after participant B fails at first to find a location with just one tree in the map. Participant A emphasises that the starting point is a location with just one tree as both A and B's maps have a different location with two trees.

The methodological choices in this thesis are thus largely dictated by my expectation that focus phenomena are best observed in dialogue. As information structure has to do with the study of correlations between linguistic forms and communicative goals, efforts were made whenever possible to collect data that is dialogic and involves two participants. Among the difficulties for the researcher stemming from working with dialogic texts are: participants speaking over each other (transcription challenges), interruptions, incomplete turns, mid-

utterance self-corrections or mid-utterance stops which are not subject of study for the purposes of this thesis. Also, with naturalistic data there is an abundance of fragmented answers, ellipsis being an information-structural phenomenon in its own right.

In addition, I targeted specific linguistic forms in searchable electronic copies of Hindi novels and in the EMILLE corpus. To complement the findings, elicitation sessions provided negative data for testing hypotheses and were also a source of native speaker intuitions on contextual felicity. Elicitation sessions were also more form-driven by targeting a specific word order. I worked with consultants on constructing mini dialogues based on their intuitions on contextual appropriateness of utterances. Elicitation sessions also proved a good way for investigating low-frequency constructions such as fronting the main verb away from the auxiliary (34). I also asked consultants to continue utterances as the one in (34) to see what elements can be contrasted.

(34) bol pranav rah-aa t^h-aa lekin …
speak Pranav.M PROG-M.SG be.PST-M.SG but
'Speaking, Pranav was but …'

In summary, a variety of data gathering methods were used for an investigation of the expression of focus in Hindi in keeping with recommendations in the literature (Skopeteas, 2012; Steube, 2004). For a list of sources of data that was not recorded and/or elicited by me, see Appendix A. Data that comes from other authors is cited accordingly. All glosses and transcriptions of data published in other works is adapted for uniformity.

1.5 Organisation of thesis

This introductory chapter has so far outlined the research background in brief (Sections 1.1 and 1.2), the aims and objectives of the thesis, its empirical focus and type of analysis pursued

(Section 1.3), as well as methods used for data collection (Section 1.4). The rest of the thesis is organised as follows.

Chapter 2 centres around the notion of focus. It outlines the research context summarising in brief the empirical and theoretical study of focus phenomena cross-linguistically, as well as discussing previous work on information structure in Hindi and closely related Urdu. The chapter does not mean to be exhaustive and give a fully comprehensive overview but aims to situate the empirical and theoretical findings presented in this thesis against the wider debate on the study of information structure. It juxtaposes previous work on focus more generally and specifically in Hindi/Urdu with the dynamic approach adopted in this thesis. It highlights points of convergence and divergence with previous theoretical approaches.

Chapter 3 introduces the Dynamic Syntax framework, the conceptual claims it is based on and its formal tools. Also, as no previous work on Hindi is done from the perspective of Dynamic Syntax, the chapter presents basic assumptions on how to model Hindi subject-verb agreement, the contribution of case and verbal morphology by making use of concepts of 'underspecification' and 'update'. These assumptions are later explored and motivated in more detail in subsequent chapters of the thesis.

Chapter 4 explores nominal interpretation and discusses the challenges that arise with respect to modelling the interpretation of nominals in a language with no prototypical (in)definiteness markers. It argues that the interpretation of common nouns in Hindi is heavily context-dependent, which includes the discourse context but also the immediate linguistic context, i.e. the string of words amongst which the nominal is realised. In keeping with the general argument developed in this thesis, the chapter argues that an account needs to be pursued which focuses on *how* context-related interpretive effects are achieved in the interpretational process. Further, the chapter argues that the role of the *=ko* marker is to indicate

an NP boundary and thus trigger the compilation of all available information for the interpretation of the NP. The effect of such an analysis is that we can account for specificity effects as a result of the interaction of contextually available information and the role of the marker as an overt NP boundary.

Chapter 5 is dedicated to the role of the accusative/dative marker *=ko* and the ergative marker *=ne* in the interpretation process. Case markers are argued to project procedural information: they give directions to the parser on how the expression fits within the emerging propositional domain. The accusative/dative *=ko* marker identifies a non-agent argument, i.e. an argument that is at the receiving end of some action, whereas *=ne* identifies an agent argument, i.e. the most active participant in the event. In the Dynamic Syntax model this is captured in terms of the projection of lexical instructions that build a partial argument structure ahead of parsing the verb.

Having established the basics for modelling the steps involved in the parsing of a Hindi clause, Chapter 6 concentrates in more detail on modelling the expression of focus. It shows that an analysis expressed in procedural terms has the advantage of modelling the stepwise manner in which an open proposition is derived in the interpretation process and the point at which focal material provides an 'update' to the proposition's missing value to yield a truth-conditional formula. From such a perspective, topic and focus are not defined as grammatical categories; instead, their expression involves the manipulation of universally available grammatical mechanisms in interaction with language-specific lexical instructions and contextual information.

Finally, Chapter 7 draws a conclusion and outlines future directions for research.

1.6 Summary

This chapter has set the scene for this research study. Section 1.1 put the research in context: it explored in brief what the study of information structure is about and situated the type of analysis pursued in this thesis against the wider discussion in the literature. Section 1.3 introduced the empirical scope of the thesis and theoretical approach. Section 1.4 discussed the procedures followed for Hindi data collection and Section 1.5 outlined the content and organisation of the rest of this thesis. In what follows, Chapter 2 discusses the notion of focus in more detail.

2 Focus

2.1 Introduction

The formal organisation of utterances is dependent on the immediate linguistic, as well as extra-linguistic context in which they occur – an observation that has proved to be valid across languages. However, there is a great degree of variation both across as well as within languages when it comes to identifying grammatical reflexes of information-structural properties. This has led to an abundance of proposed notions and definitions in the literature on information structure. Further, there is little consensus when it comes to the place of information structure in grammar: some approaches treat information-structural properties as grammatically encoded, while other emphasise that extra-grammatical factors are at play.

This chapter is dedicated to the notion of focus, often defined intuitively as 'new' or 'non-presupposed' information. It gives a brief overview of some existing theoretical approaches, proposed definitions and empirical findings on the expression of focus cross-linguistically. The purpose of the discussion in this chapter is to introduce the phenomena falling under the label of 'focus', as well as the wider discussion in the literature on the notion of focus. In this way the chapter lays the theoretical foundations on which the proposed analysis

steps. It argues for a procedural account of focus effects, which takes the *way* propositional meaning is built up incrementally in context as central, rather than defining a universally available focus category and/or grammatical primitive.

In what follows, Section 2.2 discusses in brief semantic approaches to the notion of focus, concentrating on proposed definitions and conceptual claims upon which this thesis builds on. Section 2.3 surveys morphosyntactic strategies for the expression of focus identified cross-linguistically (often referred to as 'focus marking'). Section 2.4 summarises work done so far with respect to the study of information structure in Hindi and notes that most formal approaches propose an analysis on the basis of an utterance that 'contains' focus. The context, however, is often understood to be important in so much as it elicits the utterance but plays no active role in the analysis itself. Section 2.5 elaborates on the type of analysis pursued in this thesis. Section 2.6 draws a summary and conclusion in preparation for Chapter 3 which introduces the Dynamic Syntax formalism in detail.

2.2 Previous approaches

2.2.1 Focus

In his influential study, Lambrecht (1994) argues for focus is to be understood as a relational pragmatic category between an element of the proposition and the proposition itself. To take a Hindi example, consider the exchange between A and B in (35):

(35) *Context*: A and B hear a female voice singing.

A: kaun	gaa	rah-ii	hai	tumheN	maaluum	hai
who	sing	PROG-F	be.PRS.3SG	2.DAT	knowing	be.PRS.3SG

'Who is singing, do you know?'

B: mer-ii beTii (gaa rah-ii hai)
1SG.POSS-F daughter.F sing PROG-F be.PRS.3SG
'My daughter (is singing).' (elicited)

A's question suggests that A assumes that the proposition 'someone is singing' is shared between the interlocutors and it is taken for granted. In Lambrecht's terms, 'x is singing' is the presupposed open proposition. It is 'open' as it contains a variable which stands for a missing argument. B's answer establishes a relationship between the referent of the focus *merii beTii* 'my daughter' ('x') and the given proposition ('x' is singing'), namely that 'x = B's daughter'. It is the establishment of this relationship between a referent and a given proposition that is informative for the addressee. Note that the predicate can be dropped in B's answer. This is because the open proposition 'x is singing' can be retrieved from the immediate context. B's single-word answer *merii beeTii* 'my daughter' is interpreted against this immediate context as providing a value for the variable (see Chapter 6 for a Dynamic Syntax formal account).

Lambrecht proposes the following formal definitions for the notions of focus, assertion and presupposition:

(36) FOCUS: The semantic component of a pragmatically structured proposition whereby the assertion differs from the presupposition. (Lambrecht, 1994: 213)

(37) PRAGMATIC ASSERTION: The proposition expressed by a sentence which the hearer is expected to know or believe or take for granted as a result of hearing the sentence uttered. (Lambrecht, 1994: 52)

(38) PRAGMATIC PRESUPPOSITION: The set of propositions lexicogrammatically evoked in an utterance which the speaker assumes the hearer already knows or believes or is ready to take for granted at the time of speech. (Lambrecht, 1994: 52)

To exemplify what is meant by these definitions, Lambrecht differentiates between three types of focus structure depending on what part of the pragmatically structured proposition is in focus: predicate-focus structure, argument-focus structure and sentence-focus structure. In predicate-focus structures the subject is in the presupposition and the predicate is in focus. A

Hindi example is given in (39). The presupposed subject *kaar* 'car' in B's answer can be dropped as its referent can be retrieved from the immediate linguistic context – A's question. The rest of the utterance, the predicate, expresses information about the car and has informational value – it represents the focus.

(39) *Context*: A sees B working on the car.

A: kaar=kaa kyaa huaa hai
car.F=GEN.M.SG what be.PFV.M.3SG be.PRS.3SG
'What has happened to the car?'

B: (kaar) k^{h}araab ho ga-yii hai
car.F broken/defective be go-PFV.F be.PRS.3SG
'It has gotten broken/defective.' (elicited)

Lambrecht also refers to this type of structure as 'topic-comment' where the topic is the presupposed portion of the sentence and the comment – the non-presupposed portion. He proposes the following definition of topic:

(40) TOPIC: A referent is interpreted as the topic of a proposition if in a given situation the proposition is construed as being about the referent, i.e. as expressing information which is relevant to and which increases the addressee's knowledge of this referent. (1994: 131)

The evoked presupposition is, thus, that *kaar* is available as a topic and the proposition can be construed as a comment about the topic. In this case, the evoked presupposition can be formulated as: 'the car is a topic for comment x'. What is asserted is the relationship between the topic referent and the event denoted by the predicate.

Lambrecht argues that the topic-comment structure is cross-linguistically the 'unmarked' one:

> "Across languages, the subject of a sentence will be interpreted as its topic and the predicate as a comment about this topic unless the sentence contains morphosyntactic, prosodic, or semantic clues to the contrary" (1994: 136).

He describes this as a tendency which does not mean that subject and topic should be equated. Cross-linguistically, however, there is a strong tendency for topical material to be realised in the canonical subject position. This is certainly true for Hindi, as we saw in Chapter 1, where topical elements appear clause-initially while focused material is preferably 'housed' at the preverbal position. The initial position in Hindi is accepted to be the topic position and the preverbal – the default focus position (Butt & King, 1996; Kidwai, 2000). This is not a strict requirement as focused subjects can also be realised in their canonical clause-initial position (see the discussion in Section 1.1; p. 11-12).

This leads us to the second type of focus structures which Lambrecht refers to as argument-focus structures. In these structures the focus expression provides a missing entity to an open proposition. To give an example, consider (41) where we observe a fronted topic object *ciTThii* 'letter' and a preverbal focused subject. A's question yields the open proposition 'x wrote letter'. Then, B's reply evokes the presupposition 'x wrote the letter' and asserts that the one who wrote the letter is the speaker (B) in contrast to A's belief ('x wrote the letter', 'x = speaker').

(41) Correction: subject focus

A: ciTT^{h}ii miira=ne lik^{h}-ii
letter.F Mira.F=ERG write-PFV.F
'Mira wrote the letter.'

B: nahiiN (ciTT^{h}ii) maiN=ne lik^{h}-ii
no letter.F 1SG=ERG write-PFV.F
'No, I wrote (the letter).' (elicited)

The third type is the sentence-focus structure, also referred to in the literature as 'all-new', 'presentational' and 'thetic' structures, which lacks a focus-presupposition articulation. In such cases no presupposition is evoked and both the subject and predicate are in focus (i.e.

the whole sentence is in focus). Lambrecht treats existential constructions, as well as locative inversions (Bresnan & Kanerva, 1989), as subtypes of sentence-focus. In (42)(a) we see an existential construction taken from the opening line of a story with which the main character, a hat seller, is introduced. Note that the numeral *ek* is used. As we will see in Chapter 4, the numeral *ek* is used as an indefinite article in Hindi for introducing new discourse referents. This allows the story teller to subsequently pick up the referent, as in (42)(b), with the use of the third person pronoun *vah*, which acts as the topic.

(42) Start of a story

(a) ek Topii bechne-vaalaa[9] t^{h}-aa
one hat seller-VAALAA be.PST-M.SG
'There was a hat seller.'

(b) vo shahar=se TopiyaaN laa-kar
3SG city=from hat.PL bring-CONJ

gaaNv=meN bechaa kar-t-aa t^{h}-aa
village=in sell do-IMPF-M.SG be.PST-M.SG
'He used to bring hats from the city and sell (them) in the village.' (*Lit.* He, having brought hats from the city, used to sell (them) in the village.') (extract from *Topii Bechnevala aur Bandar*[10])

A similar construction is given in (43) with an initial locative expression *rasoii=meN* 'in the kitchen'. In the context of a question such as 'Why are you looking so scared?' or uttered out of the blue, it performs, as per Lambrecht's definitions, an event-reporting function and does not evoke a presupposition.

[9] In this example, v*aalaa* attaches to the oblique form of the verb *bech-* 'sell' to mean 'one who sells'. See Montaut (2004) who describes the uses of *vaalaa* as an adjectival suffix.
[10] See Appendix A for a list of data sources.

(43) rasoii meN chuuhaa hai
kitchen in mouse.M be.PRS.3SG
'There is a mouse in the kitchen.'

Note, however, that native speaker intuitions indicate a strong correlation between syntactic position and contextual felicity. The only difference between (43) and (44) is in the ordering of the locative expression *rasoii=me* 'in the kitchen' and the common noun *chuuhaa* 'mouse'. As evident from the translation, native speakers share intuitions that the initial noun *chuuhaa* in (44) can only be construed as picking up a referent from the discourse; it yields a definite reading as the topic of the utterance, as a response to a question such as, for example, 'Where is the mouse?'. We observe again a strong correlation between the expression of topical material and the clause initial position.

(44) chuuhaa rasoii meN hai
mouse kitchen in be.PRS.3SG
'The mouse is in the kitchen.' (elicited)

Another influential theoretical contribution is made by Rooth (1985, 1992). Rooth's *Alternative Semantics* is a semantic framework based on the idea that focus triggers alternatives: "the focus semantic value of a phrase of category S is the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the focused phrase" (1992: 75). It states that an expression α has an ordinary value $[[\alpha]]^0$ and a focus value $[[\alpha]]^f$. The focus semantic value is a set of alternatives from which the ordinary semantic value is drawn, i.e. the ordinary semantic value is an element of the focus semantic value, $[[\alpha]]^0 \in [[\alpha]]^f$. For example, the focus semantic value for a sentence such as $[_S$ Mary likes $[\text{Peter}]_F]$ is a set of alternative propositions of the form 'Mary likes *y*' which are relevant for the interpretation of the focus-containing utterance. The formal notation is illustrated in (45). The ordinary semantic value is given in (45)(a) where like(**m**, **p**) is a

proposition and **m** and **p** are individuals. (45)(b) shows the focus semantic value, namely a set of propositions of the form 'Mary likes *y*', where *y* is an element of the domain of individuals.

(45) Alternative semantic values for $[_S$ Mary likes $[\text{Peter}]_F]$ (following Rooth (1992)):

(a) Ordinary semantic value
$[[\text{Mary likes } [\text{Peter}]_F]]^0 = \text{like}(\mathbf{m}, \mathbf{p})$

(b) Focus semantic value
$[[\text{Mary likes } [\text{Peter}]_F]]^f = \{\text{like}(\mathbf{m}, y) \mid y \in E\}$, where E is the domain of individuals

The strength of such an approach is that it provides a definition of focus which is independent of grammatical strategies for its expression. This is recognised by Krifka (2007, 2008) who proposes the following general definition of focus, based on Rooth's theory of alternative semantics:

(46) Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions. (Krifka, 2007: 18)

This definition is general enough to be applied for the investigation of how focus is expressed across languages as it does not make reference to specific focus marking strategies, nor does it specify interpretational effects of focus: "it may well be that different ways of focus marking signal different ways of how alternatives are exploited; e.g., focus marking by cleft sentences often signal an exhaustive interpretation that in-situ focus lacks" (Krifka & Musan, 2012: 7). Under this approach the existence of alternatives is indicated on the surface by accent, syntactic constructions or other strategies (see Section 2.3). Note that such a definition also allows for languages not to show any 'dedicated' focus marking strategies. For example, Zerbian (2006) argues that the Bantu language Northern Sotho does not show a grammatical focus marking strategy: focus constituents 'end up' in clause-final position as a result of (morpho-)syntactic

processes that target discourse-old constituents, such as deletion, pronominalization or dislocation to the right or left periphery. This point will be revisited in Section 2.3.

Building up on previous work, Krifka (2007, 2008) proposes a model of information exchange in which the notion of *Common Ground* [11] (CG) is central. The CG consists of a set of shared propositions between the interlocutors but also a set of entities – the discourse referents – that have been introduced into the CG; see also Féry and Krifka (2008) and Krifka and Musan (2012) for a more detailed introduction to the notion of CG. Thus, the CG constantly evolves and is continuously enriched with information shared between the interlocutors. Also, speakers 'package' their utterances with respect to the CG at the time at which the utterance is realised: "communication can be seen as continuous change of the common ground, i.e., of the information that is mutually known to be shared in communication; speakers plan their contribution with respect to the common ground" (Krifka & Musan, 2012: 1). For example, in Hindi new discourse referents tend to be introduced with the use of the numeral *ek* and can be subsequently picked up with a pronoun or a bare common noun (see example (42) above, as well as Chapter 4 for a more detailed discussion) – this, in essence, reflects speaker assumptions about the status of referents in the CG, as discourse-new vs. discourse-old (i.e. retrievable from the context).

An important distinction is drawn between CG content and CG management to differentiate between semantic and pragmatic uses of focus. While semantic uses of focus have a truth-conditional impact and relate to CG content, such as the use of focus sensitive particles like *only*, pragmatic uses of focus have to do with CG management, i.e. with the communicative goals of interlocutors and do not affect CG content (Féry & Krifka, 2008;

[11] The notion itself goes back to Stalnaker (1974) and Karttunen (1974).

Krifka, 2007, 2008; Krifka & Musan, 2012). This thesis is concerned with pragmatic uses of focus and I will not go into the details of semantic uses of focus that influence factual information; for this, see, for example, Krifka (2007, 2008).

Krifka (2007) lists the following examples of pragmatic uses of focus: answers to *wh*-questions, corrections, confirmations, parallel constructions, delimitation. He argues that a question is a device for CG management, it guides the direction in which the CG is to develop, it indicates the informational needs of the speaker. A question is interpreted as a set of alternative propositions (Hamblin, 1973) – see the representation in (47)(a); the question word *who* enforces the restriction that *x* is a person. The answer in (47)(b), and more precisely – the ordinary meaning, identifies one of the propositions, i.e. it picks it out from the set, and adds it to the CG content. The focus within the answer, signalled by pitch accent in English, induces alternative propositions which correspond to the meaning of the question, accommodating it as a CG management strategy. This is in essence very similar to what Lambrecht proposes: the answer in (47)(b) evokes a presupposed open proposition 'x *took the book*' and asserts that 'x= *Peter'*.

(47) Question-answer sequence:

(a) Who took the book?
{took(book)(*x*) | *x* ∈ person}

(b) [PEter]$_F$ took the book.
Ordinary meaning: took(book)(peter)
Focus-induced alternatives: {took(book)(*x*) | *x* ∈ entity}

The difference between answers to *wh*- questions and corrections is that with the latter focus alternatives include a proposition that was proposed in the immediately preceding CG. For example, when (48)(b) is uttered in the context of (48)(a), this leads to a corrective interpretation, as the two propositions differ. Following the same logic, (49)(b) receives a

confirmative interpretation in the context of (49)(a) as the propositions expressed by the interlocutors are the same.

(48) Correction:

(a) John took the book.

(b) (No,) [PEter]$_F$ took the book!

(49) Confirmation:

(a) Peter took the book.

(b) (Yes,) [PEter]$_F$ took the book.

Other pragmatic uses of focus described by Krifka (2007) are parallel structures (50) and delimitation which subsumes contrastive topics (51) and focus in frame setting expressions (52):

(50) Parallel structure:

MAry stole the COOkie and PEter stole the CHOcolate. (Krifka, 2007: 13)

(51) Contrastive topics:

A: What do your siblings do?

B: [My [SIster]$_{Focus}$]$_{Topic}$ [studies MEDicine]$_{Focus}$, and [my [BROther]$_{Focus}$]$_{Topic}$ is [working on a FREIGHT ship]$_{Focus}$. (Krifka, 2007: 34)

(52) Focus in frame setting:

A: How is business going for Daimler-Chrysler?

B: [In GERmany]$_{Frame}$ the prospects are [GOOD]$_F$, but [in AMErica]$_{Frame}$ they are [losing MOney]$_F$. (Krifka, 2007: 36)

In (50) both clauses evoke the same set of alternatives: {stole(*x*)(*y*) | *x*, *y* ∈ entity}. As it will be discussed in Section 2.2.2 shortly, parallel structures such as (50) are often analysed as yielding contrastive focus readings, as they display explicit alternatives (Repp, 2010). The two clauses show the overt alternatives *cookie* and *chocolate* which contrast with each other. (51) shows a topic with a rising accent – *my SIster*; Krifka describes it as an aboutness topic that contains a focus (often referred to as contrastive topics). The focus on *SIster* indicates that there are alternatives to the aboutness topic and acts as an indication that more information follows. The second clause introduces the contrasted topic *my BROther*.

A Hindi example of a parallel structure is given in (53), taken from Gambhir (1981: 91). Speaker A asks that members of the set of people who ate something (set M = {Ram, Dev, Babu, ….} are linked with members of the set of eating items (set E = {halva, cake, barfi, …}). The reduplication of the *wh=* question word *kya* indicates A's expectation that there is more than one items of eating. The three conjuncts in B's reply provide explicit alternatives – a defining characteristic of contrast (Repp, 2010, 2016). The parallel structure in B's reply involves two contrast pairs, i.e. two different sets of alternatives which are contrasted to each other; first, there is the set of people that have ate something and second, there is the set of foods that were eaten. The subjects *raam=ne*, *dev=ne*, *baabuu=ne* provide a replacement to the *wh-* term in A's question and under Krifka they qualify as instances of contrastive topics, i.e. topics that contain a focus.

(53) A: bataa-o kis=ne kya kya k^{h}aa-yaa
tell-IMP who.OBL=ERG what what eat-PFV.M
'Tell me who ate what.'

B: maiN bataa-t-ii huuN raam=ne halvaa dev=ne kek
1SG tell-IMPF-F be.PRS.1SG Ram.M=ERG halva.M Dev.M=ERG cake.M

aur baabuu=ne kʰaa-ii hai barfii
and Babu.M=ERG eat-PFV.F be.PRS.3SG barfi.F
'I'll tell you. Ram halva, Dev cake, and Babu ate barfi.' (Gambhir, 1981: 91)

Frame setters, as in (52), are also understood as indicating alternatives. The speaker choses one out of a possible set of frames and states that the proposition holds with respect to this frame. A corresponding structure to Krifka's 'frame setters' in Hindi is (perhaps) the one shown in (54). Speaker A picks up the frame *bʰaaratiyaa kʰaane meN* 'as for/within Indian food' from the context and asks for further information relating to that frame:

(54) *Context*: A and B talk about Diwali celebrations. B is not from India. A asks B what they ate during the celebration. B says they ate Indian food. A follows with a further question:

A: bʰaaratiyaa kʰaane=meN kyaa kʰaa-yaa tʰ-aa
Indian food.OBL=in what eat-PFV.M.SG be.PST.M.SG
'As for/Within Indian food, what did (you) eat?' (*Lit*. 'In Indian food, what did you eat?') (recorded spontaneous speech; 121116-050033)

In this section I have discussed two of the most influential semantic approaches to focus (see also Matić (2015) for an overview): Lambrecht's (1994) approach which defines focus as the part of a proposition by which the assertion content differs from the presupposition, and Rooth's (1985, 1992) alternatives-based approach to focus as the evocation of alternatives, later explored by Krifka (2007, 2008) through the lens of a model for information exchange in which the notions of common ground content and management play central roles. Both approaches propose a definition of focus which is not tied to a specific grammatical strategy for its expression. Lambrecht (1994) defines types of focus structures, depending on what part of an utterance is in focus: the whole sentence, an argument or the predicate. The alternatives-based

approach to focus, however, is particularly flexible in this respect: it easily allows for subparts of a phrase to be in focus, such as determiners or genitive modifiers.

The two approaches are compatible as making an assertion is essentially the speaker's move towards context-update, i.e. adding some information to the shared context or common ground (Stalnaker, 2014). This implies the existence of alternatives to what is asserted (Matić, 2015), whether the alternatives are explicit (e.g. correction) or implicit (e.g. *wh*- question-answer pair). Following this line of thought, focus constitutes information update (or context update) in relation to some presupposed proposition by picking up and asserting an alternative out of a set of potential alternatives. Focused material is the part of the utterance which carries information to be added to the context, i.e. it performs a context-updating function. The so-called focus constructions, intuitively understood as 'highlighting' or 'emphasising' some part of the proposition, are linguistic strategies which direct the listener's attention to what is asserted, or under the alternatives-based approach – to the presence of alternatives to what is asserted. Such constructions involve deviations from 'neutral'/'basic' word order, the use of specific morphological markers and/or intonational contours (see Section 2.3); they are understood here as pragmatically 'marked', i.e. as achieving an interpretive effect often described as intuitions of emphasis, prominence or highlighting some part of an utterance.

The discussion so far has not differentiated between focus types. Often, however, contrastive and/or exhaustive readings are argued to be ascribed to a specific subtype of focus, defined as a category in its own right with distinct grammatical reflexes. In what follows, I introduce in brief some views expressed in the literature when it comes to the notion of contrast with the purpose of outlining the position adopted in this thesis.

2.2.2 Types of focus: perspectives on contrast

Most commonly, two types of focus are identified: information/presentational focus and contrastive/identificational focus. The notion of contrast is a common point of dispute among scholars working on information structure (Repp, 2016). Some argue that the two types of focus differ in terms of the meaning they encode and – at least in some languages – the grammatical strategies for their expression. Typically, contrastive marking is argued to surface when alternatives are explicitly present in the discourse. Parallel structures and corrections are often given as prototypical examples of utterances containing contrastive foci as they involve the expression of explicit alternatives which contrast with each other (Repp, 2010).

Generally, contrastive focus is understood to express the exclusion of alternatives and involves *ex situ* strategies for its realisation, while information focus is expressed *in situ* and introduces new information (Zimmermann & Onea, 2011). Other strategies identified that are argued to support the split into two basic focus types are special prosodic patterns and morphological markers, where more marked constructions, i.e. "less economical", coincide with "a more marked interpretation" (Zimmermann & Onea, 2011: 1665) such as contrastive and/or exhaustive readings.

Syntactic approaches mostly concentrate on the identification of dedicated syntactic positions for the expression of contrast. As briefly discussed in Section 1.1, É. Kiss (1998), drawing on data from Hungarian, proposes to split the focus category into *identificational* and *information focus* where the former is semantically an operator expressing exhaustive identification and the latter – new information. While information focus is not associated with syntactic reordering, identificational focus involves movement to the specifier position of a functional projection, called the focus phrase (FP), and is realised in the preverbal position. Responsible for the syntactic re-ordering is the head (F) of the focus phrase which triggers V-

to-F movement and ensures adjacency between the identificational focus and the V. Examples are given below: in (55)(a) *pétert* is realised in the canonical postverbal position, while in (55)(b) it is realised in the immediately preverbal position (in **bold**), leading to an exhaustive reading as indicated by the English translation. *It*-clefts in English and the Hungarian preverbal position are argued to give rise to exhaustive readings with truth-conditional effect.

(55) Hungarian focus positions:

(a) mari fel hívta pétert [*in situ*: non-exhaustive]
Mary up called Peter.ACC
'Mary called up Peter.'

(b) mari **pétert** hívta fel [*ex situ*: exhaustive]
Mary Peter.ACC called up
'It was Peter that Mary called up.' (adapted from É. Kiss, 1998: 256)

É. Kiss further proposes that cross-linguistically identificational focus is subject to parametric variation: [−/+ exhaustive], [−/+ contrastive]. Hungarian identificational focus shows a strong [+exhaustive] feature as it involves obligatory realisation in the preverbal position. In Finnish, identificational foci and contrastive topics are realised in the left-peripheral position; therefore, the [+contrastive] feature is strong, resulting in movement. With respect to Finnish, Vallduví and Vilkuna (1998) distinguish between *rheme* and *kontrast*: *rheme* corresponds to É. Kiss' information focus; *kontrast*, however, is an independent feature which occupies the left-peripheral position and can attach to both left-peripheral *rhemes* and *themes*. *Kontrast* reminds of Rooth's *Alternative Semantics* as it is an 'operator-like' element, as evident from the definition in (56):

(56) If *a* is kontrastive, a MEMBERSHIP SET M = {…, a, …} is generated and becomes available to semantic computation as some sort of quantificational domain. (Vallduví & Vilkuna, 1998: 83)

More recently, Neeleman, Titov, Van de Koot, and Vermeulen (2009) make a similar argument; they propose a third IS category of contrast which can enrich the more basic notions of topic and focus. This gives us four different IS categories (topic, focus, contrastive topic and contrastive focus) which may be associated with different syntactic operations. What these studies have in common is that they assume a direct correspondence between form and meaning, attempting to account for interpretational differences in syntax. Their analyses are based on the positing of pragmatic features that trigger displacement to some structural position. The empirical evidence for identifying a type of focus associated with distinct grammatical strategies that encode contrastive and/or exhaustive readings has been disputed, specifically with data from Hungarian (Onea, 2007; Wedgwood, 2005; Wedgwood et al., 2006; Zimmermann & Onea, 2011) but remains a source of debate (É. Kiss, 2016) .

On the other side of the argument, contrastive readings are argued to arise pragmatically; they are to be understood as interpretive effects achieved in context, rather than grammatically encoded meanings. Drawing on examples from English, Lambrecht argues that "contrastiveness, unlike focus, is not a category of grammar but the result of the general cognitive processes referred to as "conversational implicatures" (2004: 291). In other words, Lambrecht treats contrastiveness as an epiphenomenon, i.e. arising from contextual factors, rather than a category of grammar.

The alternatives-based approach (Rooth, 1985, 1992) also opposes the division between contrastive focus as the exclusion of alternatives and information focus as introducing new information. This is because all subtypes of focus are understood to be variations of the idea that focus indicates the presence of alternatives that are relevant for interpretation, whether the alternatives are explicit in the discourse or implicit (Krifka, 2007, 2008). Subtypes of focus, then, and different focus constructions, have to do with different ways in which alternatives are

exploited (Krifka & Musan, 2012). Zimmermann and Onea (2011) elaborate on this idea arguing that focus is a universal cognitive category which is underspecified for its formal realisation and facilitates information update by indicating "which alternatives are directly relevant for the evaluation of a given assertion in a particular context" (2011: 1658). They directly oppose the idea of postulating types of focus which differ in terms of semantic content and formal expression: "the alternative-invoking nature of focus can be exploited to various pragmatic ends, so that we end up with different pragmatic uses of focus, or pragmatic *focus types*" (2011: 1662). Starting with the assumption that all focus types involve focus alternatives, different pragmatic focus types are to be understood in terms of the interaction of the ordinary meaning of a focus constituent α with the evoked set of alternatives A. Different uses of focus as defined by Zimmermann and Onea (2011) are given in (57):

(57) Pragmatic focus types from Zimmermann and Onea (2011):

(a) A focus constituent X expresses *new-information* if α introduces an element of A into the common ground, and if the alternatives to α have not been explicitly introduced in the preceding discourse.

(b) A focus constituent X is used *correctively* if α competes with one or more elements of A for introduction in the Common Ground, where α's competitors have been explicitly mentioned in the preceding discourse.

(c) A focus constituent X is used *selectively* if α introduces an element of A into the common ground, and α is chosen from a restricted subset of A the members of which have been explicitly mentioned in the preceding context.

(d) A focus constituent X is used *contrastively* if α is juxtaposed to one or more elements of A that are denoted by constituents Y, Z, . . . in the preceding discourse, where Y, Z, ... are of the same syntactic category and denote into the same semantic word fields.

(Zimmermann & Onéa 2011: 1663)

To illustrate Zimmermann and Onea's argument with Hindi examples, consider (58)-(61):

(58) New-information focus:

(a) miiraa=ne kyaa piyaa
Mira.F=ERG what drink.PFV.M
'What did Mira drink?'

(b) us=ne [chaay]$_F$ pii / [chaay]$_F$ pii / [chaay]$_F$
3SG.OBL=ERG tea.F drink.PFV.F tea.F drink.PFV.F tea
'She drank tea.'/ '(She) drank tea.' / 'Tea'.

(59) Corrective focus:

(a) miiraa=ne kŏfii pii
Mira.F=ERG coffee.F drink.PFV.F
'Mira drank coffee.'

(b) nahiiN [chaay]$_F$ pii
NEG tea.F drink.PFV.F
'No, (she) drank tea.'

(60) Selective focus:

(a) miiraa=ne chaay pii yaa kŏfii
Mira.F=ERG tea.F drink.PFV.F or coffee.F
Did Mira drink tea or coffee?

(b) [chay]$_F$
tea.F
'Tea.'

(61) Contrastive focus:

(a) miiraa aur raam=ne kyaa piyaa
Mira.F and Ram.M=ERG what drink.PFV.M
'What did Mira and Ram drink?'

(b) miiraa=ne (to) [chaay]$_F$ pii aur raam=ne [kŏfii]$_F$
Mira.F=ERG TOP tea.F drink.PFV.F and Ram.M=ERG coffee.F
'Mira drank tea and Ram – coffee'.

The focus status of *chaay* 'tea' in (58) indicates the presence of a set of alternatives (A = {tea, coffee, coke, juice, water…}) out of which one alternative is picked (α = tea). When there are

no overt alternatives to the one picked and asserted, the focus constituent expresses new information. In (59), the picked alternative competes with an explicit alternative from previous discourse for corrective purposes. In (60), focus is used selectively; an alternative is selected from a subset of explicitly mentioned members of the set A of drinks. Following the same logic, in (61) a contrastive interpretation arises as the parallel structure juxtaposes overt alternatives. This shows how different focus-related interpretive effects can be accounted for as stemming from the interaction of what is asserted and what is available in the discourse context, i.e. as interpretive effects achieved as a result of the interaction of the semantics of focus and contextual information.

When it comes to *it*-clefts, Zimmermann and Onea (2011) argue that the exhaustiveness effect is not part of the asserted meaning; it is due to inference and does not carry the meaning of *only*. They propose that the exhaustive reading has a different origin, perhaps an existential presupposition triggered by the *it*-cleft. Similarly, they suggest that the exhaustive reading associated with the Hungarian preverbal position may also be understood as coming about as a presupposition. In fact, Onea (2007) and Onea and Beaver (2009) show that the exhaustive interpretation in Hungarian syntactic foci is not obligatory. An interesting perspective is offered by Wedgwood (2009) who argues that the English *it*-cleft and the Hungarian preverbal position give rise to similar interpretive effects but are achieved in distinct ways. This argumentation is further developed in Matić and Wedgwood (2013) where they argue against a cross-linguistically applicable category of focus as a whole. They reject the idea that we can investigate the formal expression of a single meaning across languages and expect that languages consistently reserve grammatical strategies solely for the expression of this meaning (see Section 1.1).

Against the backdrop of differing views on the notion of focus (and its types) and the variation of focus-marking strategies not only across languages but also within languages, Matić and Wedgwood (2013) make an argument that it might be the case that so-called focus constructions are not grammatical realisations of a universally applicable category of focus but are to be treated as distinct phenomena which achieve comparable results (see also Wedgwood (2005, 2009)). Matić and Wedgwood (2012) further point out that the use of a specific grammatical strategy for the expression of focus does not guarantee that it is 'dedicated' solely to this function. For example, in Southern Quechua (SOV) the morpheme *-m/-n* attaches to *wh*-words and focused terms, as in (62)-(63). In addition, the morpheme has been analysed as an evidentiality marker in declarative sentences, as shown in see (64):

(62) ima-ta-**m** Mariya yacha-n?
what-ACC-FOC/EVID Mariya know-3SG
'What does Mariya know?' (Sánchez, 2010: 134)

(63) pidru wasit-ta-**n** ruwa-n
Pedro house-ACC-FOC make-3SG
'It is a house that Pedro builds.' (Muysken, 1995: 380)

(64) pilar-qa t'antata-**n** mikhurqan
Pilar-top bread-MI ate
p = Pilar ate bread & speaker saw that *p* (Faller, 2002: 18)

This raises attention to a particular problem that has to do with the way we 'look' for focus and types of focus in predefined contexts: the correspondence between a particular context and linguistic construction does not guarantee that it is dedicated for the expression of an information-structural category.

Matić and Wedgwood (2013) question the extent to which assuming an underlying semantic similarity of so-called focus constructions across and within languages offers

explanatory potential. Efforts are to be concentrated on accounting for how similar interpretive effects are achieved through different means. Their argument is supported by cross-linguistic data which shows that so-called focus constructions are not 'dedicated' strategies for the expression as focus as they perform diverse functions.

The question that does remain is why across languages contrastive and/or corrective contexts tend to be associated with the use of some special marking. Zimmermann and Onea (2011) offer an interesting perspective on this and make a convincing argument when it comes to the distinction between information focus and contrastive focus: contrastive focus is to be characterised "not in terms of excluded alternatives, but in terms of the speaker's estimation of the hearer's expectations regarding likely and unlikely updates of the common ground" (1663). They note that cross-linguistically "more marked grammatical structures across languages" (1665) tend to correspond to "a more marked interpretation" (1662). This idea was explored earlier in Zimmermann (2008):

> "Contrastive focus marking does not so much indicate the explicit or implicit presence of contrasting alternatives in the (non-)linguistic context, although this may be a side effect, but rather a contrast between the information conveyed by the speaker in asserting α and the assumed expectation state of the hearer: the speaker marks the content of α as – in her view – unlikely to be expected by the hearer, thus preparing the scene for a swifter update of the common ground."
>
> (Zimmermann, 2008: 358)

In other words, the use of some special grammatical marking, coinciding with intuitions of emphasis, may be understood as an attempt on part of the speaker to direct the hearer's attention to some part of the utterance to ensure a successful update of the common ground.

Zimmermann (2008) shows that there is a cross-linguistically observed tendency for contrastive foci to be 'more marked'. This seems to support the claim that new information foci and contrastive foci are marked differently. However, Zimmermann proposes that when a focus constituent is judged unexpected by the speaker as unexpected for the hearer, it is more

likely to get a contrastive marking. This means that choice of grammatical marking is impossible to predict as it has to do with speaker's intentions and assumptions about the knowledge state of the hearer. According to Zimmermann's hypothesis in (65), contrastive foci do not mark a contrast between a focus constituent and other explicit or implicit alternative to the focus constituent. Instead, they express a contrast between the information conveyed by the speaker and his/her assumptions about the mental state of the hearer.

(65) Contrastive Focus Hypothesis:

> Contrastive marking on a focus constituent α expresses the speaker's assumption that the hearer *will not consider* the content of α or the speech act containing α *likely to be(come) common ground*. (Zimmermann, 2008: 9)

In other words, a speaker uses a more marked grammatical form to direct the hearer's attentions and to shift his common ground in accordance with the information provided. Thus, a wide range of pragmatic factors need to be considered when analysing focus phenomena.

A Hindi candidate for such a grammatical strategy is the so-called emphatic particle *hii*, often said to give rise to an English *it*-cleft or an *only*-like reading (Verma, 1971), as shown in (66). The Hindi particle *hii* is called an exclusive focus marker by Sharma (1999) and a marker of narrow focus by Kidwai (2000).

(66) laRke hii aa rah-e haiN
boy.PL EMPH come PROG-PL.M be.PRS.PL
Reading 1: 'Only the boys are coming.'
Reading 2: 'It's the boys who are coming.' (adapted from Verma, 1971: 91)

Like Hungarian preverbal identification focus, *hii* is often said to contribute a meaning similar to 'only'. The precise contribution of *hii* and the diversity of its uses has been a challenge to capture under a single unified analysis (Bajaj, 2016; Bhatt, 1994; Montaut, 2004; Varma, 2006). While *hii* seems to coincide with an exclusive reading, some uses of *hii* remind of

Zimmermann's (2008) argument that speaker's assumptions about hearer's expectations need to be considered. For example, in (67), the use of *hii* is used by speaker B to put emphasis on what is asserted, i.e. the fact that the speaker herself prepared the pizza:

(67) A: pizza bahut tasty hai kis=ne banaa-yaa
pizza a lot tasty be.PRS.SG who.OBL=ERG make-PFV.M
'The pizza is very tasty. Who made it?'

B: maiN=ne hii banaa-yaa
1SG=ERG EMPH make-PFV.M.SG
'I made (it).' (elicited)

Such a need for emphasis might come in a situation in which the speaker assumes that the hearer expects that someone else has made the pizza. In this case, there is contrast not with an explicitly stated element but between what is asserted and what is assumed by the speaker to be potential alternatives for the hearer. From the perspective of alternative semantics, this can be defined as the assertion 'x = the speaker' with respect to the presupposed open proposition 'x made pizza' expressed with A's question. The contribution of *hii* indicates a pragmatic contrast between the value of x and the context, i.e. it acts as an instruction to the hearer to construct a relation between what is asserted and what is presupposed.

The following extracts from the novel *Gunahon ka Devata* by Dharamvir Bharati show the diversity of *hii*'s uses (the *hii* particle is in **bold**). Pronouns and demonstratives show forms with incorporated *hii*; for example, the form *tumhiiN* in (68)(b). The extract in (69) shows a very common use of *hii* with an imperfective participle: *dekhte hii* translates as 'as soon as X saw' or 'upon seeing'. In my understanding what is emphasised here is the temporal link between the two events: the event of Sudha smiling happens immediately after the event of her seeing that Chander has entered the room.

(68) (a) kapuur ab=ki baar tum Draiv kar-o pammii bol-ii
Kapoor now=GEN.F time.F 2PL drive do-IMP Pammi say-PVF.F
'Kapoor you drive this time, said Pammi.'

(b) nahiiN tum**hiiN** Draiv kar-o kapuur bol-aa
no 2PL.EMPH drive do-IMP Kapoor say-PFV.M.SG
'No. You drive, said Kapoor.' (Extract from *Gunahon ka Devata*: 73-74)

(69) (a) chandar sud^{h}aa=ke kamre=meN gayaa
Chandar Sudha=GEN.OBL.M room=in go.PFV.M.SG
'Chander went into Sudha's room.'

(b) dek^{h}-te **hii** sud^{h}aa muskaraa paD-ii
see-IMPF EMPH Sudha smile fall-PFV.F
'As soon as (she) saw, Sudha smiled.' (Extract from *Gunahon ka Devata*: 76)

Other uses of *hii* include attaching to adjectives and adverbs, as in (70)(b), with which it acts as an intensifier (Bhatt, 1994). Going back to Zimmermann's idea of contrastivity, the use of *hii* here again seems to relate to the speaker's judgment that 'X is good' emphasising that all possibilities of X being not-good, which might be relevant for the hearer, are to be excluded. With numerals it gives an 'only' reading, as in (71); this can be thought in terms of emphasis on the value of the numeral – one as opposed to not-one.

(70) to tum itne pareshaan kyoN ho gaye chandar
TO 2PL so much upset why be go.PFV.PL Chander
'So why have you become so upset, Chander!'

us=ne to achchh-ii **hii** baat kah-ii t^{h}-ii
3SG=ERG TOP good-F EMPH thing.F say-PFV.F be.PST-F
'She said a good thing.'
or 'It's what she said.' (Extract from *Gunahon ka Devata*: 77)

(71) mer-ii zindagii=meN ek **hii** vishvaas=kii chaTTaan hai
1SG.POSS-F life.F=in one EMPH faith=GEN.F rock.F be.PRS.3SG

vah ho tum
3SG be.PRS.2PL 2PL
Lit.: 'In my life there is only one rock of faith. That is you.' (Extract from *Gunahon ka Devata*: 77)

The particle also appears between reduplicated nouns and adjectives, as well as between reduplicated participles as in (72). Here, the pragmatic contrast seems to be between the two states of the subject – sleeping while sitting:

(72) vahaaN jaa-kar dek^{h}-aa to aaraam-kursii=par baiT^{h}e-**hii**-baiT^{h}e
there go-CONJ see-PFV.M TOP rest-chair=on sit-EMPH-sit

Do shuklaa so rah-e haiN
Dr Shukla sleep PROG-PL be.PRS.PL
Lit.:'He went there and saw Dr. Shukla is sleeping sat on the armchair.' (Extract from *Gunahon ka Devata*: 45)

It is not immediately obvious how all these different uses relate to the notion of focus and/or contrast. In my view, the particle *hii* indicates a pragmatic contrast to do with the speaker's assumptions in beliefs to do with expectations and likelihood, as per Zimmermann's (2008) proposal. However, there is a need for much more detailed empirical work on the uses of *hii*.

This section has given a brief overview of different theoretical perspectives on the notion of contrast and different types of focus. While some assume a direct correspondence between focus types and their grammatical expression seeking explanations in syntactic structure, others concentrate on the pragmatics of such correspondences: more marked constructions achieve more marked interpretations and have to do with speaker's assumptions about the common ground and hearer's expectations. In what follows I give a brief overview of focus marking strategies identified cross-linguistically.

2.3 The empirical landscape

Across languages focus and contrast have been associated with prosodic (e.g. English, see Büring, 2009 for an overview of prosodic strategies), morphological (e.g. Gùrùntùm, Hartmann and Zimmermann, 2009) and syntactic phenomena (e.g. Hungarian, É. Kiss, 1998). The

discussion in this thesis is limited to syntactic and morphological strategies; prosody has been shown to play an instrumental role for the expression of focus in a number of languages but falls outside of the scope of the thesis as modelling prosodic cues will be left for future avenues. The thesis does hint, however, on how prosodic patterns can be modelled as procedural instructions on how the parse proceeds (see Chapter 6).

A survey of focus-marking strategies reveals a great deal of variation not only across languages but within languages as well (Zimmermann & Onea, 2011). What is observed is that a language may show more than one focus marking strategy. For example, some languages show distinct linguistic means for focusing different types of constituents: verb focus vs. term focus vs. sentence focus. For example, Saeed (1999) shows that Somali has three types of focus morphemes for focusing different constituents. Other languages show subject-object asymmetries; for example, in Makhuwa focused objects are placed in the immediately postverbal focus position, whereas subjects are ungrammatical in this position and can only be focused via clefts (van der Wal, 2009). Also, for some languages researchers have indicated 'optional' focus-marking. The West Chadic language Ngizim has a subject focus construction which involves subject inversion into a final position and a focus particle preceding the subject which is optional in some contexts and obligatory in others (Grubic, 2010).

When it comes to information structure related syntactic re-ordering, basic word order is a good predictor for the ordering of topic and focus (Herring, 1990). Verb-subject (VS) languages show a tendency to order focus before topic in contrast to subject-verb (SV) languages which order topic before focus (Herring, 1990: 164). Topics in SV languages tend to be preposed as opposed to postposed in VS languages. Foci are postposed in SV and preposed in VS languages (Herring, 1990: 166). Herrings's study points to an interesting correlation between typological differences of languages such as basic word order and the

realisation of topic and focus. Similarly, Morimoto (2000) attempts to establish some typological basis for an analysis of topic and focus and their structural position. She notes that focus tends to correlate with the position of the verbal head in the clause. In verb-initial languages focus is realised clause-initially, in SVO languages it is placed at the immediately postverbal position but head-final languages, while the most preferred position is the immediately preverbal one, exhibit the most variation by allowing discourse-new information to be realised postverbally. A more recent study by Güldemann et al. (2015) notes that cross-linguistically "marked topicalisation" occurs in initial and final sentence positions. The former is known as left dislocation or topicalisation, and the latter – right dislocation, or afterthought. In other words, there is a cross-linguistically observed tendency for context-reflecting material to appear at clausal edges.

Bringing all these observations together, pragmatically motivated ordering of material with differing information status relates to two factors. First, these is the typological aspect, namely a language's basic word order as the starting point for pragmatically motivated re-ordering. The second factor is the cross-linguistically observable tendency for early realisation of context-setting information such as aboutness topics, new/shifted topics, contrastive topics, and late realisation of material that is retrievable from the context such as given information or material that provides some additional information such as afterthoughts. The early placement of context-setting information can find an easy explanation once the dynamics of the parsing/production process is taken into account. This ensures that topical material is realised early on and provides an immediate context against which subsequent expressions are to be parsed.

Following this line of thought, context-updating material, or focus, could be shown to be realised in particular linear positions as a result of typological properties of languages (i.e.

ordering of the verb and its arguments) together with the tendency for realising topical expressions at clausal edges and more specifically, the tendency of realising new/shifted/contrastive topics early on against the backdrop of which an update is made. This line of thought can lead to posit not dedicated language-specific 'focus positions' *per se* (as often argued) but that context-updating material 'ends up' in a particular position as a result of typological properties of the language and the tendency to place context-reflecting material early on relative to which an update is made (especially new and contrastive topics) or later on as a reminder of a continuing topic.

Such a perspective also allows an easy explanation for subject-object asymmetries in Hindi, namely the observation that subjects need not be obligatorily placed in the preverbal position when focused (as discussed in Section 1.1). Focused subjects 'end up' in the preverbal position when topical material is fronted, as in (73)(a) (repeated from (1)(a)). However, there is no pressure for material that can be retrieved from the context to be realised obligatorily in the clause-initial position and focused subjects can remain in situ, as in (73)(b) (repeated from (1)(b)). This points to the possibility that the preverbal focus position may in fact be an artefact of general cognitive processes to do with early placement of discourse-given material for easy access and retrieval from the context or early realisation of new/shifted topics for setting up early information against which an informational update is made.

(73) *Context*: Who bought the book?

(a) kitaab pranav=ne kharid-ii O[S]$_F$V
book.F Pranav.M=ERG buy-PFV.F
'Pranav bought the book.'

(b) pranav=ne kitaab kharid-ii [S]$_F$OV
Pranav.M=ERG book.F buy-PFV.F
'Pranav bought the book.' (elicited)

2.4 Discussion on previous work on Hindi

Word order variation in Hindi has received considerable scholarly attention (Butt, 2014; Butt & King, 1996, 1997; Gambhir, 1981; Kidwai, 2000; Mahajan, 1990). In this brief overview of previous work on Hindi I will discuss only studies that make recourse to discourse-motivated word order variation. Gambhir (1981) gives an overview of different interpretive possibilities in the peripheries when it comes to preposing and postposing material with differing information status, 'new' vs. 'old'. Kidwai (1999, 2000) offers a formal account of scrambling within the Minimalist tradition as focus-driven movement. Under her approach, positional focus is licensed with the checking of a morphosyntactic [FOCUS] feature. Butt and King (1996), and later Butt (2014), explore a Lexical-Functional Grammar (LFG; Bresnan, 2001) approach to pragmatically motivated word order variation, defining a strict correspondence between structural position and discourse function. In what follows I discuss these works in turn.

Gambhir (1981) is (probably) the first detailed study on word order variation in Hindi within the generative tradition that argues that syntactic re-ordering does not affect truth conditions but is pragmatically motivated. Gambhir offers a descriptive account of possibilities for preposing and postposing 'new' and 'old' material for expressing contrast, emphasis, de-emphasis, introducing a topic, reinforcing a topic, providing additional information (afterthoughts), creating suspense. Gambhir does not address the preverbal position which is often associated with the expression of focus in Hindi; she limits the discussion to the sentence-initial and sentence-final positions of the Hindi clause. Nonetheless, she makes interesting observations with respect to interpretive possibilities in the peripheries. She argues that no one-to-one correlation between a constituent's position and its function can be identified:

> 'It has been shown that there is not always one-to-one correlation between the position of a constituent and its function. For instance, for emphasis a constituent may be moved

> to sentence-initial position or sentence-final position depending on exact discourse conditions […]. Similarly a topic does not necessarily occur in sentence-initial position; it may occur in sentence-final position depending on the precise discourse involved.'
> (Gambhir, 1981: 331)

In general, Gambhir looks at the information status of material, 'old' vs. 'new', and its positional realisation. She follows a definition of topic as 'given' or 'old' information; a topic is shared information between speaker and hearer which may be explicitly stated or inferred. Generally, it occurs in the sentence-initial position, as in (74) (the topic *b^{h}aashan denaa* 'giving a lecture' is in **bold**). The initial position also holds contrastive topics, as in (75) where the topics *laRkii* 'girl' and *laRkaa* 'boy' are contrasted to each other and each appears in the clause-initial position.

(74) *Context*: A introduces B, and requests him to say something to the audience on the occasion of an opening ceremony of a cricket club. B walks up on the stage and says:

dek^{h}-iye	**b^{h}aashan**	**de-naa**	muj^{h}e	nahiiN	aa-t-aa …
see-IMP	lecture.M	give-INF	1SG.DAT	not	come-IMPF-M.SG

'Look, as far as giving a lecture is concerned, I don't know that …' (Ashk, 1969: 185 via Gambhir, 1981: 302; transcription and glosses are adapted)

(75) laRkii muj^{h}e bahut ach^{h}-ii lag-ii
girl.F 1SG.DAT very good-F strike-PFV.F

laRkaa T^{h}iik-T^{h}iik hii hai
boy.M so so EMPH be.PRS.3SG
'The girl, I liked very much; the boy is so-so.' (Gambhir, 1981: 308; transcription and glosses are adapted)

Following a definition of topics as 'old' and 'given' information, Gambhir explains that they can also be realised in sentence-final position. This is exemplified in (76) (transcription, glosses and translations are adapted) where in the last line the genitive modifier *film dek^{h}ne kaa* 'of watching films' is realised in final position to 'reinforce' or 'recall' the (continuing) topic.

(76) *Context*: Talking about going to the movies.

(a) ham to har hafte **film** **dek^{h}-ne** jaa-t-e haiN
1PL TOP every week film see-INF.OBL go-IMPF-PL be.PRS.PL
'We go to watch a film every week'

(b) magar hamaar-ii ek dost hai
but 1PL.POSS-F one friend be.PRS.SG
'but we have a friend'

(c) us=ke pati=ko **film** **dek^{h}-naa** bilkul pasand nahiiN
3SG.OBL=GEN.OBL husband=DAT film see-INF at all liking not
'her husband does not like watching films at all'

(d) hamaar-ii dost=ko lekin behad shauk hai **film dek^{h}-ne=kaa**
2PL.POSS-F friend=DAT but very fondness be.PRS.SG film see-INF.OBL=GEN.M.SG
'but my friend is very fond of watching films.' (Gambhir, 1981: 304; transcription, glosses and translations are adapted)

An interesting observation Gambhir makes with respect to topics is that contrastive topics are realised sentence-initially and contrasted elements in sentence-final position are not topics: "if the constituents or elements to be contrasted are topic constituents in a given context, they are moved to sentence-initial position, otherwise they are moved to sentence-final position" (1981: 311). In addition to housing already introduced topics, the final position is used for both emphasis and de-emphasis of constituents, as well as afterthoughts.

De-emphasis occurs when the final constituent represents 'old' information; very commonly the final position also houses 'highly predictable elements' (1981: 316), as shown by material in **bold** in (77) and (78).

(77) kab=se lik^{h} rah-e haiN **aap**
when=from write PROG-PL be.PRS.PL 2PL
'Since when have you been writing? (Sarika, 1978: 40 via Gambhir, 1981: 316; transcription and glosses adapted)

(78) *Context*: The husband calls the servant for his evening tea, but there is no reply. Right then his wife says:

(a) shaayad vo so rah-aa hai
perhaps 3SG sleep PROG-M.SG be.PRS.SG
'Perhaps he is sleeping.'

(b) maiN le aa-t-ii huuN **chaay**
1SG take come-IMPF-F be.PRS.1SG tea
'I will bring you the tea.' (Gambhir, 1981: 317; transcription and glosses are adapted)

Emphasis is achieved when the postposed constituent expresses 'new' information, as opposed to 'predictable' or 'old' information. An example is given in (79) (Gambhir describes this as an 'announcement style') where ergative subjects are realised postverbally. Another example of postverbal material are afterthoughts, which Gambhir describes as additional information: "if a speaker or writer forgets to give some information during an utterance but later on thinks that it is necessary to give that information" (1981: 320), it can be realised postverbally. An afterthought is illustrated in (80) with the postverbal genitive modifier *divaali kaa* (in **bold**) which provides additional information about the head noun *kaard* 'card'.

(79) is gaane=kii d^{h}un banaa-ii hai **lakshmii** **kaant**
this.OBL song.OBL=GEN.F tune.F make-PFV.F be.PRS.SG Laxmi Kant

pyaare laal=ne aur gaa-yaa hai lataa maNgeshkar=ne
Pyare Lal=ERG and sing-PFV.M.SG be.PRS.3SG Lata Mangeshkar=ERG
'The tune of this song is given by Laxmi Kant Pyare Lal and is sung by Lata Mangeshkar.' (Gambhir, 1981; 319; transcription and glosses are adapted)

(80) tumheN meraa kaarD mil gayaa th-aa **divaalii=kaa**
2.DAT 1SG.POSS-M card.M receive go.PFV.M.SG be.PST-M.SG Diwali=GEN.M.SG
'Did you receive my Diwali card?' (Gambhir, 1981: 321; transcription and glosses are adapted)

Gambhir lists other reasons/functions for postposing material to the right of the tensed verb, such as ease of processing in the case of 'heavy' constituents or for creating suspense

which I will not discuss here. Gambhir's work gives a very good idea of word order possibilities in Hindi, showing that it is by no means a strictly head-final language. Material with differing information status can be realised postverbally to perform diverse pragmatic functions. Interestingly, the emphasis and de-emphasis effects she describes are tied to the discourse status of the postposed constituent and not to positional realisation.

Gambhir's observations can find an explanation from a processing perspective. Postposing discourse-new material leads to intuitions of emphasis or creating suspense as it involves a delay in information update. Following the same logic, postposing discourse-old information is associated with de-emphasis as it constitutes information that can be retrieved from the context; its realisation after the verb simply acts as a reinforcer or reminder of the topic in discourse. More concretely, with Hindi being a head-final language the expectation is that at the time of parsing the tensed verb and/or auxiliary everything that is needed for deriving a proposition is already provided. In cases in which discourse-new information is not presented until after the verb, this leads to intuitions about a more 'marked' construction and emphatic readings. This is because part of the propositional meaning is missing at the time of parsing the verb and TAM information. In (81) this can clearly be seen with the late realisation of *raajaa* 'king' and *Jaysing*^{h}. In the first clause, *raajaa* is realised after the past form of the copula 'be' and away from the numeral *ek* 'one' which acts as an indefinite article (see Chapter 4 on nominal interpretation). Similarly, the proper name *Jaysing*^{h} is realised post-'be', instead of the more 'canonical' pre-'be' position. As a side note here, the prosodic pattern of such non-canonical constructions can also be treated as signalling that more information follows after the copular verb. Hindi prosody, however, goes beyond the scope of this thesis as it needs further investigation.

(81) sun-o ek t^{h}-aa **raajaa** us=kaa naam t^{h}-aa **jaysingh**
listen-IMP one be.PST-M.SG king.M 3SG.OBL=GEN.M.SG name.M be.PST-M.SG jaysingh.M
'Listen, there was a king. His name was Jaysingh.' (Gambhir, 1981: 318)

In the case of discourse-old information in the postverbal position, the same effect is not achieved as it constitutes information that can be retrieved from the context and is thus not 'missing' (i.e. the proposition can be completed); its realisation after the verb further reinforces the continuing topic. Afterthoughts, then, can be thought of as material that provides further information about some part of the proposition. These ideas become more explicit once formalised in subsequent chapters of this thesis using the tools of Dynamic Syntax. In short, Gambhir's observations about functions of different word orders can find explanations once the directionality of the parsing/production process and the role of the context are taken into account. Interpretive effects associated with deviations from the default parsing route (a reflection of which is Hindi's basic word order) can be understood as the result of the exploitation of mechanisms of grammar in conjunction with contextual information.

Kidwai (1999, 2000) discusses non-canonical word orders such as (82)(b) where the subject *raam* is realised in preverbal position, as an answer to (82)(a). The preverbal position is also the preferred position for the realisation of *wh*- question words. Kidwai argues that "the driving force behind the scrambling operation in Hindi-Urdu is FOCUS itself" (1999: 219). She differentiates between NARROW and WIDE focus. Narrow, or non-neutral, focus involves the partitioning of the utterance into a presupposed and asserted parts, as in (82)(b) where the preverbal subject is interpreted as the focus. Wide, or neutral, focus is associated with out-of-the-blue utterances that follow the default word order, as in (83), or act as answers to a question such as '*What happened?'*.

(82) Narrow/non-neutral focus:

(a) kitaab kaun laa-yegaa [OSV]
book.F who bring-FUT.3SG-M
'Who will bring the book?'

(b) kitaab raam laa-yegaa
book.F Ram.M bring-FUT.M.3SG
'It is Ram who will bring the book.' (Kidwai 1999: 217-218; transcription and glosses are adapted)

(83) Wide/neutral focus:

raam kitaab laa-yegaa [SOV]
Ram.M book.F bring-FUT.M.3SG
'Ram will bring the book.' (Kidwai, 1999: 218; transcription and glosses are adapted)

Kidwai (1999) proposes a minimalist theory of focus under which 'focusing is a product of a GRAMMATICAL rule' (1999: 214). She proposes that displacement is driven by a [+FOCUS] feature: "the heterogeneity of (non-neutral) focus-marking mechanisms attested in natural language – positional, prosodic and morphological – differ only in terms of superficial realisation of an identical feature" (Kidwai, 1999: 224). In other words, focus is treated as a grammatical primitive which is universally available but subject to distinct surface realisations across languages.

The last study I discuss here is Butt and King's (1996) non-movement account of discourse-motivated word order variation in Hindi-Urdu. Their work puts Hindi-Urdu into the list of the so-called discourse configurational languages (É. Kiss, 1995) where discourse functions are associated with certain structural positions. Butt and King identify four discourse functions: focus, topic, background and completive information. Each discourse function is characterised in terms of the features [+/− Prominent] and [+/− New]. These are summarised in Table 3 below for ease of discussion. An example is given in (84) where the subscript 'T'

stands for topic, ‘Cl’ stands for completive information, ‘F’ stands for focus and ‘B’ stands for background information.

Table 3 Discourse functions and features, based on Butt and King (1996)

		Discourse functions			
		Focus	Completive information	Topic	Background information
Features	[+/− New]	+	+	−	−
	[+/− Prom]	+	−	+	−
Position		Preverbal	Generated within S and outside VP	Initial	Postverbal

(84) Question-Answer pair:

(a) naadyaa kahaaN=se aa rah-ii hai
Nadya.F where=from come PROG-F be.PRS.3SG
‘Where is Nadya coming from?’

(b) [naadyaa]$_{T}$ to[12] [ab^{h}ii]$_{Cl}$ [tofii]$_{Cl}$ [bazaar=me]$_{F}$ k^{h}arid
Nadya.F indeed just now toffee.F market.M=in buy

rah-ii th-ii
PROG-F be.PST-F
‘Nadya was just buying toffee from the market.’

(c) #naadyaa to ab^{h}ii [bazaar=me]$_{F}$ k^{h}arid rah-ii t^{h}-ii [tofii]$_{Back}$
Nadya.F indeed just now market.M=in buy PROG-F be.PST-F toffee.F
(Butt and King, 1996: 4)

The function of focus is to fill an informational gap, and as such it is characterised as [+New] and [+Prominent]. In example (84)(b), the focus *bazaar me* ‘in the market’ is realised in the preverbal position; as Butt and King argue, it answers the question ‘Where is Nadya coming from?’ in (84)(a). Completive information also introduces new information, and it thus carries the feature [+New], but unlike focus it is not [−Prominent] as the information it brings is not of primary importance. In (84)(b), completive information is found between the topic *Nadya*

[12] *To* is often described as a topic marker (Montaut, 2015). In this example Butt and King (1996) gloss it as ‘indeed’.

and the focus *bazaar me* 'in the market'. The topic is the other prominent discourse function and occupies the clause initial position. Unlike focus and completive information, it is [−New] as it constitutes 'old' information. Background information is also [−New] but unlike topic it does not bring prominent information and is [−Prominent]; it provides additional information 'as to how the new information provided fits in with the already known information' (1996: 4). Syntactically, background information is realised in the postverbal position. To illustrate that only 'old' or 'known' information can occupy this position, Butt and King give (84)(c), uttered in the context of (84)(a). The object *tofii* 'toffee' is postposed to the postverbal position yielding an infelicitous utterance. This is because in the given discourse it does not constitute 'old' information – a requirement for background information in postverbal position. Going back to Gambhir's observations, however, an explanation in terms of an [−/+New] feature as to why certain material is infelicitous in final position does not hold empirical ground.

As it will be discussed in Section 2.5 shortly, post-posing 'new' material to the postverbal position is a 'marked' construction and involves presentational (as we saw in (79)) or contrastive-type focus (as in (85)) on the delayed argument. (84)(c) is contextually infelicitous as the focus of the utterance is on *bazaar=me* 'in the marker'.

(85) A: bataa-o kis=ne kya kya k^{h}aa-yaa
tell-IMP who.OBL=ERG what what eat-PFV.M.SG
'Tell me who ate what.'

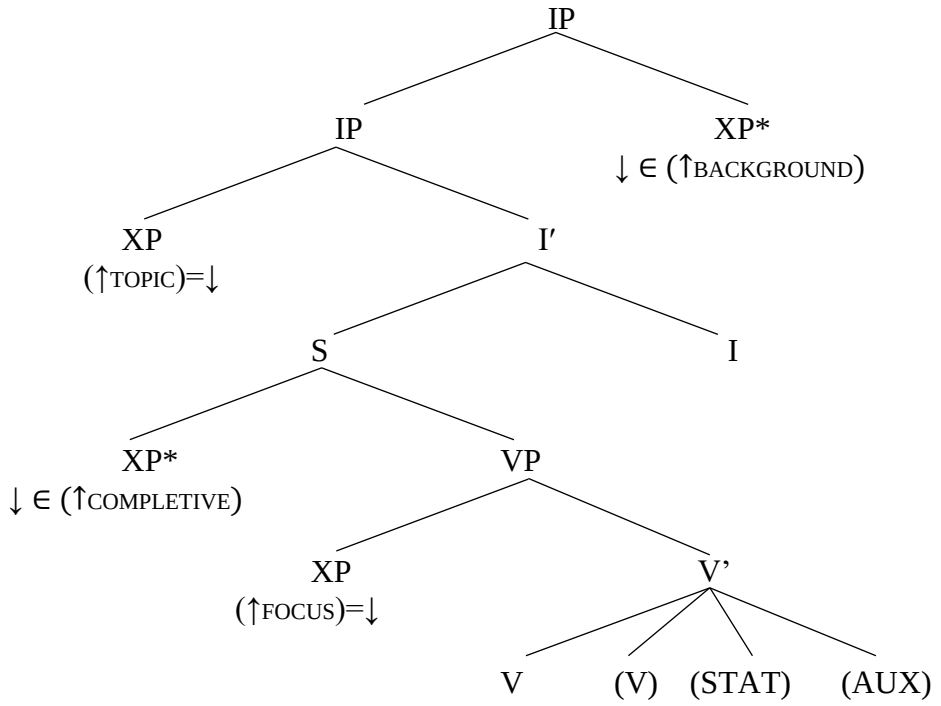
B: maiN bataa-t-ii huuN raam=ne halvaa dev=ne kek
1SG tell-IMPF-F be.PRS.1SG Ram.M=ERG halva.M Dev.M=ERG cake.M

aur baabuu=ne k^{h}aa-ii hai **barfii**
and Babu.M=ERG eat-PFV.F be.PRS.3SG **barfi.F**
'I'll tell you. Ram halva, Dev cake, and Babu ate barfi.' (Gambhir, 1981: 91)

In (85), B answers to A's question involves a parallel construction where the verb is realised only in the last conjunct. These types of constructions are often described as yielding contrastive interpretations. A asks for each member of the set of people who have ate something to be assigned an item of eating. This is exactly what the parallel construction does. The final realisation of *barfii* 'barfi' here is not a problem as the delayed information is the focus of attention, i.e. it links the subject's referent to a member of the set of foods.

Butt and King assume a one-to-one correspondence between discourse function and syntactic position. A constituent receives a particular discourse function interpretation, if it appears in the appropriate position. Syntactic positions act as licensers: "in order for a constituent to be interpreted as having a particular discourse function it must appear in the appropriate position" (1996:6). Phrase structure positions are associated with particular discourse functions via functional uncertainty, as illustrated in (86). Topic and focus occupy specifier positions in which only a single constituent can be licensed: topic occupies the SpecIP position and focus – the SpecVP position. Completive and background information are represented as flat structure adjunctions which allows for multiple constituents to perform the particular discourse function. Butt and King represent discourse information at the level of (f)unctional-structure but mention other possibilities when it comes to where in the LFG architecture discourse structure is to be represented.

(86) Phrase structure



(Butt & King, 1996: 6)

In later work Butt (2014) revises the analysis and places discourse functions on an independent level of (i)nformation-structure with mapping between i-structure and c(onstituent)-structure in LFG's formal architecture (King, 1997). In the revised analysis i-structure is a separate projection and Krifka's (2008) basic notions are adopted (topic, focus, givenness), instead of the feature-based notions proposed in Butt and King (1996). However, these categories are further specified by a type value (X-TYPE); the representation allows for fine-grained distinctions to be made between different types of topic, focus and givenness categories. The revised i-structure analysis for (87) is shown in (88). Given material in the clause-final position is further specified as 'background'. The assumed c-structure is given in (89). Information from c-structure is projected to i-structure; this is indicated by the subscript *i*. For example, the functional equation $\downarrow_i \in (\uparrow_i \text{FOCUS})$ associates the preverbal position with the FOCUS function at the level of i-structure.

(87) [naadyaa]$_T$ to [ab^{h}ii]$_{Cl}$ [tofii]$_{Cl}$ [bazaar=se]$_F$ k^{h}arid
Nadya.F indeed just now toffee.F market.M=from buy

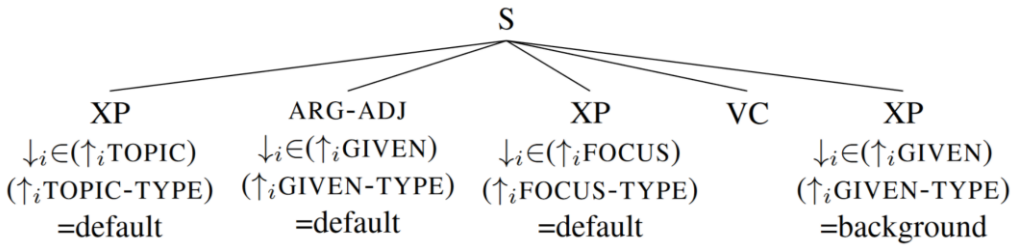
rah-ii t^h-ii [mere=liye]$_B$
PROG-F be.PST-F 1SG.GEN.OBL=for
'Nadya was just buying toffee at the market for me.' (Butt, 2014: 10)

(88) i-structure for (87)

$$\begin{bmatrix} \text{TOPIC} & \left\{ \begin{bmatrix} \text{PRED-FN} & \text{Nadya} \\ \text{TOPIC-TYPE} & \text{default} \end{bmatrix} \right\} \\ \text{FOCUS} & \left\{ \begin{bmatrix} \text{PRED-FN} & \text{bazar} \\ \text{FOCUS-TYPE} & \text{default} \end{bmatrix} \right\} \\ \text{GIVEN} & \left\{ \begin{bmatrix} \text{PRED-FN} & \text{toffee} \\ \text{GIVEN-TYPE} & \text{default} \end{bmatrix}, \begin{bmatrix} \text{PRED-FN} & \text{I} \\ \text{GIVEN-TYPE} & \text{background} \end{bmatrix} \right\} \end{bmatrix}$$

(Butt, 2014: 11)

(89) c-structure



(Butt, 2014: 11)

Butt (2014) observes that while the default position for *wh*- question words is preverbal, they can also appear *in situ*, as well as within the verbal complex (90) and clause-finally (91) giving rise to different interpretations.

(90) *Wh*- question word in postverbal position:

siitaa=ne d^{h}yaan=se dek^h-aa t^h-aa **kis=ko**
Sita.F=ERG carefully see-PFV.M.SG be.PST-M.SG who.OBL=ACC
'Sita had looked carefully at who?' (Butt, 2014: 7)

(91) *Wh*- question word within the verbal complex:

siitaa=ne d^{h}yaan=se dek^{h}-aa **kis=ko** t^{h}-aa
Sita.F=ERG carefully see-PFV.M.SG who.OBL=ACC be.PST-M.SG
Reading 1: 'Who had Sita looked at carefully?'
Reading 2: 'Who has Sita really looked at carefully?' (i.e. she had not looked at anybody carefully) (Butt, 2014: 7)

A *wh*- question word in the clause-final position leads to an echo question reading, as indicated in (90). (91) shows a *wh*- question word within the verbal complex, i.e. after the main verb and before the auxiliary. Butt explains:

> When the wh-element is in this position, an extra pragmatic meaning dimension can be added to the question. One interpretation […] is that the speaker is not actually expecting an answer to the question (giving rise to a type of rhetorical question).
>
> (Butt, 2014: 8)

To account for instances such as (91), Butt argues that the immediately postverbal position within the verbal complex is a secondary structural focus position, the primary focus being on the verb, as suggested by stress. For example, the primary focus in (92) is on the copula verb; what is being questioned is whether there were possessions in the house before the theft and not what possessions were in the house, which would have been the case if *kyaa* was realised before the head noun *saamaan* 'luggage'.

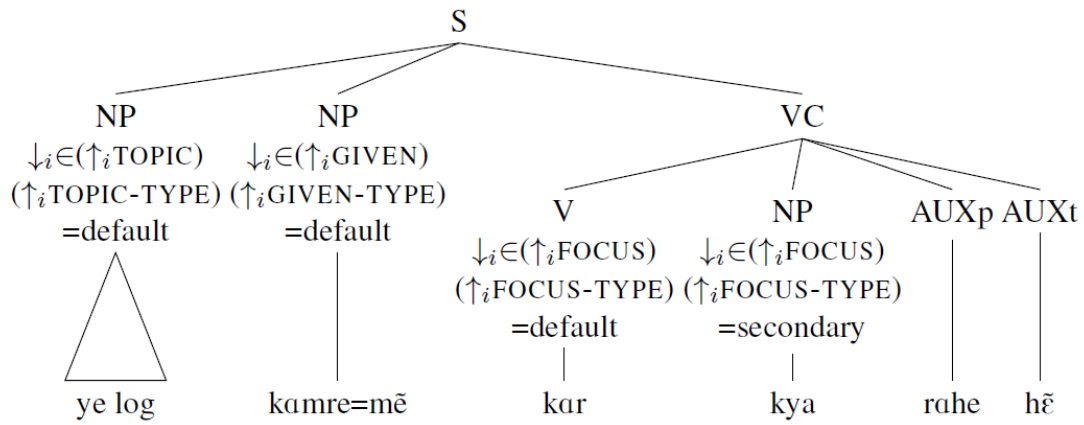
(92) un=ke g^{h}ar=meN saamaan t^{h}-aa **kyaa** pahle
3PL.OBL=GEN.M.OBL house.M=in luggage.M be.PST-M.SG what before
'What possessions did they even have in their house before (then)?' (implies: they had no possessions before) (Butt, 2014: 12; transcription and glosses are adapted)

Building on these observations, Butt proposes that the postverbal secondary focus position is used when the verb is in primary focus and is being questioned: 'the placement of a wh-element in this position signals that the speaker is not expecting an answer for the *wh*-phrase and that therefore no set of alternative answers should be opened up for the XP containing the question word' (2014: 14). The assumed c-structure from which i-structure is mapped for an utterance

such as (93) is given in (94). The i-structure is given in (95). Note that *kyaa* 'what' is assigned a secondary focus type.

(93) ye log kamre=meN kar kyaa rah-e haiN
these people room.M.OBL=in do what PROG-M.PL be.PRS.3PL
'What are these people doing in the room?' (Butt, 2014: 14; transcription and glosses adapted)

(94) c-structure for (93)



(Butt, 2014: 15)

(95) i-structure for (93)

$$\begin{bmatrix} \text{TOPIC} & \left\{ \begin{bmatrix} \text{PRED-FN} & \text{log} \\ \text{TOPIC-TYPE} & \text{default} \end{bmatrix} \right\} \\ \text{GIVEN} & \left\{ \begin{bmatrix} \text{PRED-FN} & \text{kɑmre} \\ \text{GIVEN-TYPE} & \text{default} \end{bmatrix} \right\} \\ \text{FOCUS} & \left\{ \begin{bmatrix} \text{PRED-FN} & \text{kɑr} \\ \text{FOCUS-TYPE} & \text{default} \end{bmatrix}, \begin{bmatrix} \text{PRED-FN} & \text{kya} \\ \text{FOCUS-TYPE} & \text{secondary} \end{bmatrix} \right\} \end{bmatrix}$$

(Butt, 2014: 15)

LFG's parallel architecture allows defining a separate representation of i-structure with its own primitives as part of grammar, offering a non-movement account of pragmatically

motivated word order variation. In my understanding of the proposed LFG model for Hindi-Urdu, it relies heavily on the identification of positional 'encoding' of discourse functions and their type. This is because the values of i-structure functions are identified at the level of c-structure, i.e. information from c-structure maps onto i-structure. When it comes to the notion of focus, the proposed i-structure architecture allows for multiple occurrences of focus within a single utterance and distinguishing types of focus, provided there is empirical evidence for identifying a strict correspondence between syntactic position and focus type.

In later work, Butt et al. (2016) refine Butt's (2014) analysis and show with evidence from experimental tasks with Urdu speakers that the verb cluster internal realisation of *wh*-question words has to do with prosodic constraints. The default positioning of *wh*- question words is the preverbal position where they are marked prosodically via a high pitch contour. The postverbal realisation of *wh*- is due to competition for primary stress. In the case of verb focus, to avoid the *wh*- phrase receiving primary stress it needs to be realised in a position different from the preverbal one. This allows the verb to be marked by high pitch contour. Following Büring (2015), the *wh*- phrase is an inherently prominent expression and has a secondary focus status. As such, it needs to be realised within the domain of the primary focus. For Urdu, this ends up being the immediately postverbal position.

Previous studies on Hindi-Urdu are generally consistent in attempts at identifying correspondences between syntactic positions and the expression of pragmatic functions such as topic and focus. There are generally two approaches to explaining the association of the preverbal position with focus: movement triggered by syntactic features or mapping between constituent structure and an independently defined level of information structure. Recent work by Butt et al. (2016) argues that the association of the immediately preverbal position with focus has to do with prosodic constraints.

Having outlined so far in this chapter different definitions and approaches to the notion of focus (Section 2.2) and previous work on Hindi-Urdu (Section 2.4), the next section is dedicated to comparing how the dynamic approach to focus advocated in this thesis diverges from previous work but also what insights it builds on. The claims made become more explicit as I introduce the Dynamic Syntax formalism in more detail in Chapter 3.

2.5 Dynamic approach to focus

This thesis presents an alternative approach to explaining pragmatically marked constructions in Hindi by assuming a procedural grammar architecture and following previous work within the Dynamic Syntax (DS) framework (Kempson, Cann, & Kiaer, 2004; Kempson, Kiaer, & Cann, 2009; Liu & Kempson, 2018; Marten, 2007). The DS model reflects the time-linear fashion in which semantic information accumulates, captured in terms of 'growing' structured representations of meaning with the parse of each word relative to the context. A procedural view on syntax opens possibilities for formalising the expression of focus as the manipulation of universally available grammatical mechanisms in interaction with language-specific lexical instructions and contextual information. Assuming that basic (or canonical) word order is a reflection of the most economical or default route for deriving truth-conditional meaning, any deviations from it would be made to serve pragmatic goals. From such a perspective, pragmatic notions receive procedural significance: a topic constitutes some background relative to which an informational update is made, material in focus provides the update and given information is retrievable content from the context. With these assumptions in hand, there is no need to identify movement triggers to account for deviations from basic word order, nor postulate an independent level of information structure which relates to other components of grammar. In

short, while different word order permutations lead to deriving the same truth-conditional meaning, what is different about them is the order in which subparts of a proposition are parsed relative to the context. It is precisely surface linear realisation, or – more correctly – the sequence of parsing actions that provides explanations for how focus effects arise in real-time in the process of interpretation build-up in context.

Conceptually, the approach in this thesis is in line with semantic theories on focus as indicating the presence of alternatives (Krifka, 2007, 2008; Rooth, 1985, 1992) and Lambrecht's (1994) assertion-based approach. Under these approaches, the expression of focus has to do with picking out an alternative out of a set of potential alternatives and asserting it in relation to some contextually available proposition. In this thesis, these insights are translated in dynamic terms; it is proposed to model the incremental manner in which an open proposition is derived in the interpretation process and the step at which focal material provides an update to make an assertion. For example, this can be an update to an open proposition available in the shared context (question-answer pairs), an update to some part of a proposition (corrections) or an update with respect to some partial structure in the immediate context (topic-focus sequences).

In most previous works the context is acknowledged to play a central role for the empirical identification of focus. However, for most studies it seems to be important in as much as utterances that 'contain' focus are elicited but plays no significant role in the (formal) analysis itself. Importantly, in DS the context is argued to keep a record, accessible to both speaker and hearer, of established propositional structures, as well as the actions taken to derive them (Kempson et al., 2015; Kempson, Cann, Gregoromichelaki, & Chatzikyriakidis, 2016). This allows for various types of information to be retrieved from the shared context. For example, a continuing topic need not be repeated at every turn of an exchange, as shown in

(96) with the drop of the subject in B's reply. Formally this will be represented as the retrieval of the subject value from the immediate contextually available proposition that was yielded with the parsing of A's question.

(96) A: miiraa kya kar rah-ii hai
Mira.F what do PROG-F be.PRS.SG
'What is Mira doing?'

B: (miraa/voh) k^{h}aa rah-ii hai
Mira.F/3SG eat PROG-F be.PRS.SG
'(Mira/She) is eating.'

Equally, in dialogue there is no need to produce a proposition that has already been parsed and included in the shared context, as shown in (97). B's single word reply *raam* constitutes an informational update relative to the open proposition in the immediate linguistic context, derived from the parse of A's question. Such an approach allows for an account of information structural phenomena that is not restricted to the sentence-domain.

(97) A: kaun bol rah-aa hai
who speak PROG-M.SG be.PRS.SG
'Who is speaking?'

B: raam (bol rah-aa hai)
Ram.M speak PROG-M.SG be.PRS.SG
'Ram (is speaking)?'

Equipped with these assumptions, the range of interpretive effects associated with the Hindi peripheries (discussed in Section 2.4) can be explained in terms of the preposing and post-posing of material with differing discourse status. More concretely, the heterogeneity of observed interpretive effects can be expressed in terms of how material realised clause-initially or clause-finally relates to the rest of the proposition. To give an example, see (98) from

Gambhir (1981) who explains that "crucial information is intentionally given in the end of an utterance" (1981: 325) for the purpose of creating suspense:

(98) A: buuj^{h}o yah kek kis=ne banaa-yaa hai aaj
guess this cake.M who.OBL=ERG make-PFV.M be.PRS.3SG today
'Guess who made this cake today.'

B: pataa nahiiN
know not
'(I) don't know.'

A: yah kek banaa-yaa hai, **hamaarii ch^{h}oTii biTiyaa=ne**
this cake.M make.PFV.M.SG be.PRS.3SG 2PL.POSS.F young.F daughter.F=ERG
'This cake was made by our younger daughter.' (Gambhir, 1981: 326)

In (98), in A's utterance the subject (in **bold**) is postponed to the final position. From the perspective of left-to-right parsing, Gambhir's intuitions of emphasis and suspense have to do with the fact that discourse-new/hearer-new information is delayed, i.e. it is encountered after the parse of the finite verb. In Hindi, being a head-final language, the canonical order is one in which the verb and the parse of tense-aspect information comes at the finishing stages of a parse to yield truth-conditional meaning. By delaying the subject, the human parser cannot complete the parse after the introduction of the verb and 'waits' for information to complete the proposition. In a way, this is reminiscent of semantic approaches to focus such as Lambrecht (1994) and Rooth (1985, 1992) as at the point of parsing the verb the proposition '*x* has made this cake' is derived with the value of *x* missing, as illustrated in (99)(a). As a complete proposition is not derived, the parser awaits further information. The delayed subject *hamaarii chhoTii biTiyaa* 'our younger daughter' provides the necessary 'update' for the completion of the proposition as in (99)(b).

(99) Incremental proposition-building for (98)

(a) Parsing *ye kek banaayaa hai* 'this cake has made'

Derived proposition → '*x* has made this cake', ***x* = ???**

(b) Parsing *hamaarii ch^{h}oTii biTiyaa* 'our younger daughter'

Update to proposition → '*x* has made this cake', ***x* = our young daughter**

Therefore, (99)(a) shows that at the point of parsing the verb, an open proposition is derived with a variable *x* in need of finding a value. As there is no referent that can be found from the context, the proposition cannot be completed because of the missing subject value. (99)(b), then, shows that the variable finds a value with the parse of the postposed subject. The derived open proposition '*x* has made this cake' acts as a context relative to which an informational 'update' is provided with the parse of the postverbal subject. This allows the completion of the parse.

When information that is retrievable from the context is postposed, as in (100), the same effect is not achieved as the subject can be retrieved from the context (it constitutes given material). Its final realisation simply reinforces the known subject and can easily be dropped. A's question in (100)(a) acts as a context against which the proposition expressed by B unfolds. At the point of parsing the verb of B's utterance we have a fully derived proposition as the subject value is retrievable from the context, namely A's question. The postposed subject in this case simply reinforces (some partial) context relative to which an informational update is made.

(100) A: tumhaarii beTii=ne kya banaa-yaa hai
2PL.POSS.F daughter.F=ERG what make-PFV.M be.PRS.3SG
'What has your daughter made?'

B: ye kek banaa-yaa hai (meerii beTii=ne / us=ne)
this cake.M make-PFV.M.SG be.PRS.3SG 1SG.POSS.F daughter.F=ERG 3SG.DIST.OBL=ERG
'My daughter/she has made this cake.' (elicited)

Such examples are a challenge for accounts which rely on the identification of 'dedicated' syntactic positions for the expression of discourse functions. In DS, pragmatic effects associated with postposing discourse-new and discourse-old material are captured in similar terms as the result of the interaction of structure building mechanisms and information provided by the context. In both (99) and (100), postverbal material is 'added' onto an established proposition but in the former case it provides 'missing' information and in the latter it re-enforces information that is retrievable from the context (such as given information and continuing topics).

In the left periphery, the situation is different as initially placed material is parsed in the context of a not yet established proposition. In the DS model left and right periphery asymmetries fall out naturally from the dynamics of left-to-right proposition-building (Kempson et al., 2004; Marten, 2007). The left periphery can house 'old'/'continuing' topics but also 'new'/'shifted' and 'contrastive' topics unlike the right periphery. The general preference for early realisation of 'new' and 'contrastive' topics finds a natural explanation: elements in the left periphery provide a context relative to which an informational update is made. As a result, Hindi being a head-final language, the default locus for the realisation of context-updating material ends up being the preverbal position.

2.6 Summary and conclusion

This chapter has outlined the research context and has situated the type of analysis developed in this thesis with respect to wider work on information structure in general and in Hindi in particular. The first half of this chapter provided snippets of the range of approaches and theoretical proposals that have been developed with respect to the study of focus. It has also discussed the variation observed both across, as well as within languages when it comes to so-called focus marking strategies. I limited the discussion to matters that are relevant for the current thesis. First, syntactic approaches to focus were not discussed in detail as the analysis pursued in this thesis does not involve structural positions for the expression of pragmatic notions. More emphasis was given to semantic approaches to focus which are compatible with the theoretical approach adopted in this thesis.

The second half looked at work on Hindi and elaborated on the type of analysis that this thesis pursues. It argued for an account of information structural phenomena that takes the procedural nature of interpretation build-up as central. This means putting emphasis on *how* propositional content is expressed relative to the context, rather than assuming static representation of constituent and information structure. The chapter suggested that pragmatically marked constructions are to be treated as signalling specific interpretive routes with respect to retrieving information from the context and providing material that performs a context-updating function. In the next chapter I present the theoretical framework and its formal tools in more detail.

3 Dynamic Syntax

3.1 Introduction

Having outlined the research context in Chapter 2 and how the theoretical approach adopted in this thesis fits within the wider discourse on the study of information structure, the current chapter introduces the Dynamic Syntax (DS; Kempson et al., 2001, Cann et al., 2005) framework in more detail. The formal tools of DS will be used in subsequent chapters of this thesis to propose an analysis of aspects of Hindi clause structure and to tackle context-related phenomena, such as the expression of focus.

In what follows, Section 3.2 lays out the theoretical foundations and basic assumptions behind the DS framework. It introduces the key notions and concepts that underpin the DS model, namely ideas of underspecification, update and routinisation. Section 3.3 introduces in detail the formalism and the logic behind DS binary semantic tree structures. Section 3.4 elaborates on how semantic tree structures unfold, starting from some very minimal tree at the onset of a parse to establishing a full propositional structure for a string of words. The DS concept of context is explored in Section 3.5. Finally, Section 3.6 summarises and concludes the chapter.

3.2 Basic assumptions and key concepts

3.2.1 Incrementality and the syntactic process

A major conceptual claim behind the Dynamic Syntax framework is that knowledge of language has to do with the ability to process a string of words in real time. It has to do with the ability to gradually construct meanings from lexical input (on a word-by-word basis) relative to the context. This claim sets DS aside from other major theoretical approaches; it claims that knowledge of language is not independent of language use, on the contrary – knowing a language is knowing *how* to use it (Kempson & Cann, 2018; Kempson et al., 2004; Kempson & Kiaer, 2009b; Kempson et al., 2009; Kempson et al., 2001; Marten, 2002).

DS takes a usage-based approach to the study of language and proposes a model which is built to reflect the time-linearity of natural language parsing and production. The two processes, parsing and production, are argued to involve identical mechanisms, with speaker and hearer constructing meaning in tandem (for DS work on modelling dialogues, see Kempson et al., 2015; Kempson, Gregoromichelaki, Eshghi, et al., 2019). The basic assumption behind the DS model is that intrinsic structural properties of natural language are best captured when the left-to-right, word-by-word nature of parsing and production is taken as the basis for providing syntactic explanations.

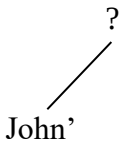
Formally, the parsing/production process is modelled as the incremental growth of semantically transparent binary tree structures. The syntactic process involves the output of a series of partial semantic structures driven by a combination of language-specific lexical information, universally available computational rules and pragmatic enrichment until a propositional structure is derived. From such a perspective, syntactic explanations emerge out of the stepwise process of accumulation of semantic content, following strictly the order in

which words and morphemes are parsed in context. Syntax has to do with the process by which partial representations of semantic content are enriched from lexical information until an interpretation is assigned for a string of words. Semantic information is expressed formally in terms of binary trees where each node is decorated with a concept (see Section 3.3 for more details). Tree structures are thus not inhabited by words and do not represent constituent structure. A sketch of the parsing process is illustrated in (101).

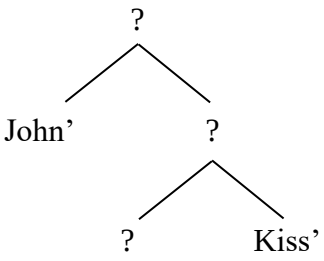
(101) Parsing *John kissed Mary* step-by-step

(a) Onset

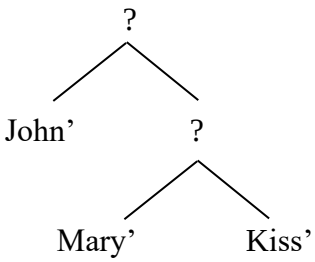
(b) Parsing *John*



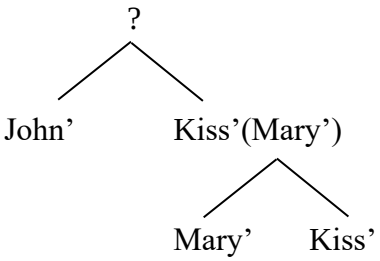
(c) Parsing *John kissed*



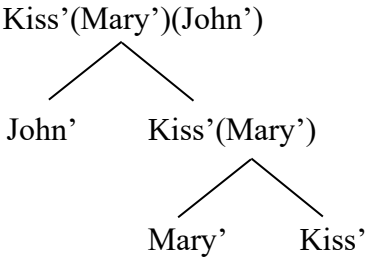
(d) Parsing *John kissed Mary*



(e) Accumulating information



(f) Final completed tree



The syntactic process involves a series of steps as each word is scanned in the order in which encountered. In (101), the parse starts with a very minimal structure which is progressively enriched with information projected by each lexical item until a fully completed tree structure is derived. The final structure in (101)(f) represents the semantic structure of the proposition expressed by the string of words *John kissed Mary*. Crucially, the final tree structure is just as important as the series of steps undertaken to derive it. Properties of natural language are argued to follow directly from the dynamics of the semantic tree-building process, driven by a combination of lexical, computational and pragmatic actions.

3.2.2 Underspecification and update

In DS the parsing/production process is modelled as strictly incremental, i.e. each lexical item is processed in the order in which it is encountered. The system, however, also allows for any aspect of meaning to remain underspecified until more information becomes available. Underspecification has to do with the manipulation of information which is in some sense 'partial' at the time of encounter. A well-formed utterance is one where processing its string of words leads to deriving a fully completed propositional structure with any aspects of underspecification resolved.

Underspecification takes two forms in the DS model – structural and semantic. Semantic underspecification is involved in the parse of lexical items that do not have a contentful value. A prime example are pronouns which are analysed as projecting placeholders in need of finding a value from the context via pragmatic actions. A pronoun projects a metavariable which picks up a logical term from the immediate discourse context. This is formally expressed in the framework as the pragmatic process of SUBSTITUTION (introduced in Sections 3.4.2.7 of this chapter).

Other anaphoric expressions such as definite descriptions and demonstratives are analysed in similar terms (Cann, 2007; see also Chapter 4); their use triggers the search for contextually salient entities. Also, in previous DS work it is proposed that the inflected verb in pro-drop languages projects a propositional template, complete with metavariables for its argument(s) (Cann et al., 2005; Chatzikyriakidis, 2010; Kempson & Kiaer, 2009a, 2009b; Kiaer, 2007, 2011). Similarly, for the Hindi example in (102) the value of the dropped subject can be identified from the immediate context. B's utterance yields the proposition ''U is coming' where U is a placeholder that picks a term from the context, in this case the topic under discussion – *Mira'*.

(102) Argument drop

A: miiraa kahaaN hai
Mira.F where be.PRS.3SG
'Where is Mira?'

B: aa rah-ii hai
come PROG-F be.PRS.3SG
'(Mira/she) is coming.' (elicited)

Structural underspecification refers to parsing expressions whose precise role in the emerging propositional structure is yet not clear; this is formally represented as the building of nodes with no fixed tree node address. For example, (103) shows that an initial phrase such as *supriyaa=ko* may be associated with either a matrix or an embedded clause. While the *=ko* marker prepares the human parser for at least a transitive structure (see Chapter 5), the precise propositional host of the initial *=ko* marked expression might not be clear immediately.

(103) Parsing *supriyaa=ko* …

(a) **supriyaa=ko** sud^{h}aa=ne kah-aa ki
Supriya.F=ACC/DAT Sudha.F=ERG say-PFV.M.SG that

ramesh miiraa=ko pyaar kar-taa hai
Ramesh.M Mira.F=ACC/DAT love do-IMPFV.M.SG be.PRS.SG
'Sudha told Supriya that Ramesh loves Mira.'

(b) **supriyaa=ko** sud^{h}aa=ne samj^{h}-aa ki
Supriyaa.F=ACC/DAT Sudha.F=ERG understand-PFV.M.SG that
ramesh ____ pyaar kar-te haiN
Ramesh.M love do-IMPFV.M.PL be.PRS.PL
'Sudha thinks that Ramesh loves Supriya.' (Dwivedi, 1994: 36; transcription and glossing adapted)

Similarly, an initial *wh*- question word such as *kaun* 'who' may be interpreted as the subject of a matrix clause (104)(a) or the subject of an embedded clause (104)(b) as the parse progresses and more information becomes available.

(104) Parsing *kaun*…

(a) **kaun** soch-taa hai ki miraa aa-yegii
who think-IMPFV.M.SG be.PRS.SG that Mira.F come-FUT.3SG.F
'Who thinks that Mira will come?' (elicited)

(b) **kaun** siitaa soch-tii hai ki ____ aa-yegaa
kaun Sita.F think-IMPFV.F be.PRS.3SG that come-FUT.3SG.M
'Who does Sita think will come?' (Dayal, 2017b: 160)

The analysis for the examples in (104)(a) and (104)(b) involves the building of an unfixed tree node at the start of a parse for the temporary retention of the contribution of the initial *wh*-expression. Establishing the role an expression plays in the overall propositional structure constitutes a structural 'update'. Notions of structural underspecification and subsequent update are formally expressed with the help of the computational rules of *ADJUNCTION and MERGE, the technical side of which is introduced in detail in Section 3.4.2.6.

However, the possibility for extraction of material out of embedded clauses does not mean that the human parser has to assume a potential long-distance dependency at the onset of a parse for the processing of each linguistic string. In fact, (103)(b) and (104)(b) are only marginally acceptable for some speakers and are only allowed under specific prosodic patterns which have not been studied in detail to date. Structural uncertainty may be resolved immediately with respect to the most local propositional domain as the subject of the matrix proposition in (104)(a), or may be 'delayed' until more information becomes available. I assume that the 'default' (and thus preferred) strategy for Hindi speakers is localised proposition building, i.e. resolving structural uncertainty as soon as possible with respect to an immediate propositional host. For long-distance dependencies, prosody is what can be argued to instruct the parser to deviate from the default route and 'delay' structural update (i.e. hold off temporary resolving the role the expression holds in the emerging proposition) until more information becomes available[13].

Case marking and verbal morphology play a significant role in identifying argument roles in the interpretation process and resolving structural update. Case markers impose restrictions on the eventual tree node address of a node under development. As we will see in Chapter 5, the role of the accusative/dative *=ko* marker, for example, is to specify that the node under development needs to find such a tree node address that it is dominated by a predicate type node. Verbal agreement marking projects restrictions to do with identifying the subject (when the verb shows subject agreement) or object (when the verb shows agreement with the object in the perfective). This allows a great degree of word order flexibility. However, in certain contexts basic SOV word order plays a key role as well. Mohanan (1992) argues that in

[13] Prosodic patterns, however, need to be studied in detail and I will not attempt modelling the contribution of prosody in the interpretation process. I assume that it has an informative role in the structural decision-making.

the absence of any morphological cues to disambiguate subject and object arguments, word order 'freezes' to SOV ordering. A strong preference for SOV ordering is also observed when there is no pragmatic motivation for pre- or postposing material. This leads us to the idea of 'routinised' local structure building which takes place in the absence of any contextual and/or prosodic information to indicate otherwise.

3.2.3 Routinisation and basic word order

Routinisation refers to the formation of routines in language processing that arise from practice (Gargett, 2011). Kempson and Cann (2007) argue that routinisation is the driving force behind syntactic change; it involves the storage of a sequence of actions as a 'routinised' unit that is retrievable relative to a trigger for the parse of the first word of some linguistic string.

In this thesis, I argue that the so-called word order 'freezing' phenomenon in Hindi (see Lee, 2001; Mohanan, 1992) is a direct reflection of routinised local structure building. 'Freezing' is observed when both NPs do not carry an overt case marker and are 'equal' in terms of animacy (Mohanan, 1990, 1992, 1994). The examples in (105)-(106) show that when S and O roles cannot be disambiguated in any other way, the only possible reading is one where the initial inanimate NP is the subject of the clause.

(105) patt^{h}ar botal toR-egaa
stone.M bottle.M break- FUT.M.3SG
(i) 'The stone will break the bottle.'
(ii) *'The bottle will break the stone.' (Mohanan 1992 via Lee 2001: 14; adapted)

(106) botal patt^{h}ar toR-egaa
bottle.M stone.M break-FUT.M.3SG
(i) 'The bottle will break the stone.'
(ii)*'The stone will break the bottle.' (Mohanan 1992 via Lee 2001: 14; adapted)

The so-called 'freezing' effects are understood in this thesis to be a reflection of a 'default' parsing route which takes precedence unless contextual, prosodic and/or other types of grammatical cues inform the parser otherwise. Such commonly used stored sequences of actions yield a template for building predicate-argument structure. For example, suppose we are modelling the steps involved for the parse of an out-of-the-blue utterance, such as (107). As the utterance is not linked in any way to previous discourse (it is an all-new sequence), the default parsing route for localised structure building is triggered.

(107) dek^{h}-o dek^{h}-o, **gaay** **b^{h}aiNs** caaT rah-ii hai
look-IMP look-IMP cow.F buffalo.F lick PROG-F be.PRS.3SG
'Look, look, a cow is licking a buffalo' (Gambhir, 1981: 282)

The parser starts with the usual goal to establish a proposition which is further divided into subgoals to derive an entity type and a predicate type which together would return a proposition. Under default, i.e. routinised, structure building, the parse of the first nominal phrase *gaay* 'cow' contributes an entity type and any subsequent expressions are then parsed as part of the predicate. How this is modelled becomes clearer as I introduce the technical side of the Dynamic Syntax framework in subsequent sections of this chapter.

3.2.4 Summary

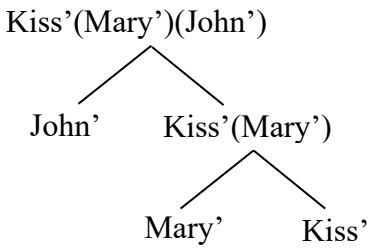
This section has introduced the key conceptual notions which will form the backbone for the analyses developed. In what follows these become more explicit as I introduce the formal tools of DS and discuss how structured representations of meaning 'grow' with the parse of each lexical item. For a more detailed introduction to the DS framework and the basic assumptions it is built on, see Kempson et al. (2001) and Cann et al. (2005).

3.3 Tree structures and tree node decorations

3.3.1 Binary tree structures and Tree Logic

In DS semantic content is represented in the form of binary branching tree structures. These tree structures are not inhabited by words and do not show word order; they represent the semantic structure of a proposition for a string of words. For example, the tree structure in (108) shows how the different concepts of a proposition are combined for the utterance *John kissed Mary*. The primer (‘) indicates that the concept is used, not the word.

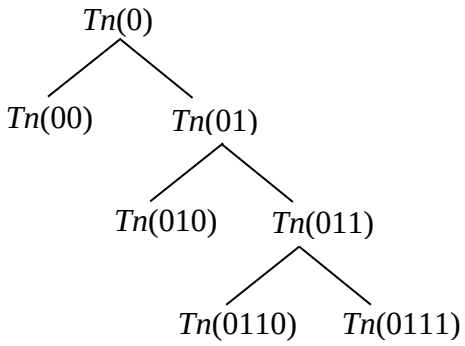
(108) Tree structure for *John kissed Mary*



Each tree node is associated with a unique tree node address. To describe the location of a particular node within the tree, the formal language of the *Logic of Finite Trees* (LOFT) (Blackburn & Meyer-Viol, 1994; Kempson et al., 2001) is used. Following LOFT, nodes branching to the left are addressed as 0 nodes and nodes to the right − as 1 nodes. Left-branching nodes are also referred to as argument nodes and right-branching nodes as functor nodes. The rootnode is the only node without a mother node and it has the tree node address 0, as shown in (109), where the predicate *Tn* stands for tree node and expresses the node’s location. The tree logic dictates that the argument daughter of some node *n* gets the tree node address *n*0 and its functor daughter gets the address *n*1 (see Cann et al. (2005) for more details). Thus, each daughter node gets the address of its mother plus 0 or 1, depending on whether it is

an argument (left-branching) or a functor node (right-branching). The rootnode's argument daughter node receives the tree node address 00 and its functor daughter node – the address 01. A binary tree with all nodes decorated for tree node address is given in (109) below.

(109) Tree structure with nodes decorated for tree node addresses

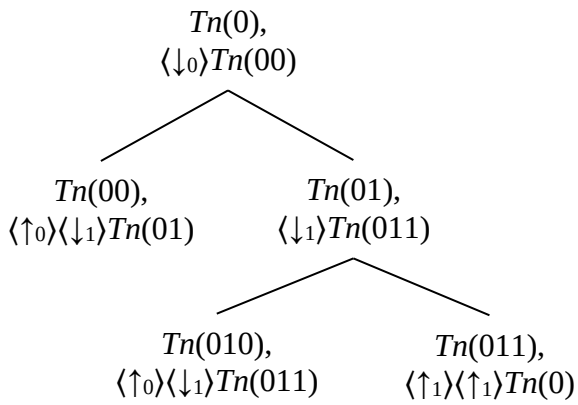


In addition, each tree node can be described with respect to other nodes in the tree. This is done with the help of two basic operators: the operator ↓ which reads as 'down a daughter relation' and ↑ which refers to a node 'up a mother relation'. The two operators can be used inside angled (⟨…⟩) or square brackets ([…]) for an existential and universal use, respectively. The existential statement ⟨↓⟩ means that there is a daughter node if you go down a daughter relation, while the universal statement [↑] addresses all mother nodes, i.e. all nodes 'up' a mother relation.

The relations between nodes can be further specified using a numerical subscript. For example, $\langle\downarrow_1\rangle$ reads as 'down a functor relation' and $\langle\downarrow_0\rangle$ reads as 'down an argument relation'. In the same way, $\langle\uparrow_0\rangle$ reads as 'up an argument relation' and $\langle\uparrow_1\rangle$ as 'up a functor relation'. Modalities can also be combined to refer to nodes in the tree which are not the immediate daughter or mother of the node whose perspective we are taking. For example, $\langle\downarrow_1\rangle\langle\downarrow_0\rangle$ is to be read as 'down a functor relation and then down an argument relation'. To give an illustration,

the tree structure in (110) shows all nodes carrying a tree node address, as well as a further statement about another node in the tree. To take tree node 00, it holds the statement $\langle\uparrow_0\rangle\langle\downarrow_1\rangle Tn(01)$ which specifies that 'up' an argument relation ($\langle\uparrow_0\rangle$) and 'down' a functor relation ($\langle\downarrow_1\rangle$) you will find tree node 01. Similarly, the statement $\langle\uparrow_1\rangle\langle\uparrow_1\rangle Tn(0)$ at the 011 node specifies that 'up' a functor relation and 'up' another functor relation you will find the 0 node, i.e. the rootnode. By combining modalities the system allows describing non-immediate dominance relations; this shows the flexibility of the LOFT system to refer to any node in the tree from the perspective of another node.

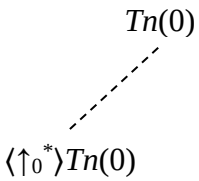
(110) Tree nodes decorated with LOFT modalities and tree node address



As we will see, a further strength of the system for the analysis of linguistic phenomena stems from the possibility to only loosely define relations between nodes. More concretely, by using the Kleene star (*) combined with the ↑ and ↓ operators, relations between nodes can be defined as underspecified. For example, the modal statement $\langle\uparrow^*\rangle$ indicates that a node is to be found 'up' an underspecified number of mother relations, i.e. zero or more. Such statements can also be combined with a numerical subscript; for example, the modal statement $\langle\uparrow_0{}^*\rangle$ says that a node is to be found 'up' an underspecified number of argument relations or is the current node itself. A node with an underspeciftied tree node address is shown in (111); the dotted line

shows that the node is not 'fixed' and the statement $\langle\uparrow_0^*\rangle Tn(0)$ indicates that the rootnode with a tree node address 0 is to be found 'up' zero or more steps along an argument relation. The Kleene + operator excludes the possibility for zero steps; for example, the modality $\langle\uparrow^+\rangle$ refers to a node 'up' one or more mother relations (never zero). Underspecification is key in DS for the analysis of natural language; further discussion on building nodes with an underspecified tree node address is due in Section 3.4.

(111) Tree structure showing a node with an underspecified tree node address



The LOFT system allows referring not only to nodes with a particular tree node address (as in (111) where $\langle\uparrow_0^*\rangle Tn(0)$ refers to the rootnode from which an 'unfixed' node is built) but also to nodes carrying particular characteristics, referred to as tree node *decorations*. For example, a statement such as $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle X$ specifies that 'up' an argument relation and 'up' an underspecified number (zero or more) of functor relations, *X* holds, where *X* stands for any type of semantic information that can 'decorate' a node. I turn to the types of semantic information, or decorations, that tree nodes carry in Section 3.3.2 below. Before that, Table 4 shows all modalities used in this thesis and their meaning.

Table 4 LOFT modalities

Modal statement	**Reads as:**
$\langle\uparrow_0\rangle X$	'*X* holds up an argument relation'
$\langle\uparrow_1\rangle X$	'*X* holds up a functor relation'
$\langle\downarrow_0\rangle X$	'*X* holds down an argument relation'
$\langle\downarrow_1\rangle X$	'*X* holds down a functor relation'
$\langle\downarrow^*\rangle X$	'*X* holds at the current node or down an underspecified number of daughter relations'
$\langle\downarrow_0^*\rangle X$	'*X* holds at the current node or down an underspecified number of argument relations'
$\langle\downarrow_1^*\rangle X$	'*X* holds at the current node or down an underspecified number of functor relations'
$\langle\uparrow^*\rangle X$	'*X* holds at the current node or up an underspecified number of mother relations'
$\langle\uparrow_0^*\rangle X$	'*X* holds at the current node or up an underspecified number of argument relations'
$\langle\uparrow_1^*\rangle X$	'*X* holds at the current node or up an underspecified number of functor relations'
$[\uparrow]X$	'for all mother nodes *X* holds'
$[\downarrow]X$	'for all daughter nodes *X* holds'

Another symbol that will be used to annotate tree nodes is the falsum ⊥ (or 'the false'). For example, in combination with the universal statement [↓], it gives us the so-called "bottom restriction" [↓]⊥ which reads as: for every node below the current node, the falsum holds. In other words, the node that holds this decoration has no daughter nodes; it is a terminal node. The bottom restriction is part of the lexical entries of full content words inhabiting terminal nodes (see Section 3.4.1 on lexical entries). The converse symbol is the verum ⊤ (or 'the true'); the symbol [↓]⊤, then, reads as: the current node is not terminal, it has daughter nodes. Other combinations are summarised in Table 5 below.

Table 5 Tree node annotations with the 'falsum' and 'verum' symbols

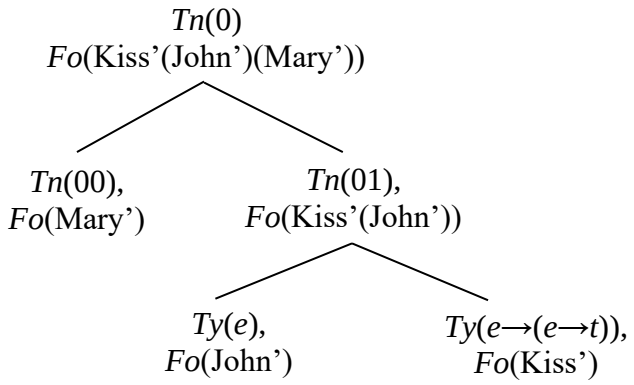
Decoration	Meaning
⊥	falsum ('the false')
⊤	verum ('the true')
[↓]⊥	'the current node is terminal; there is no structure below the current node' (also known as the 'bottom restriction')
[↓]⊤	'the current node is not terminal; there is structure below the current node'
[↑]⊥	'the current node has no mother node; there is no structure above the current node'
[↑]⊤	'the current node has a mother node; there is structure above the current node'

3.3.2 Tree node decorations: the *Tn, Fo* and *Ty* predicates

As we have seen so far, each node can be described for its unique tree node address using the LOFT system and the predicate *Tn* (*Tn* = Tree node). In addition, each individual tree node carries a semantic expression (a concept) represented with the predicate *Fo* (*Fo* = Formula), as well as information about the semantic type of the expression represented with the predicate *Ty* (*Ty* = Type).

The predicate *Fo* represents a semantic expression (a concept) and takes the form *Fo*(*X*') in the tree. For example, the *Fo* value for the word *kiss* is *Fo*(Kiss'). The prime (') in the tree structure indicates that it is not the word itself that inhabits the tree node but the concept. In addition, concepts are written with a capital letter. A tree with completed formula values is shown in (112). The tree shows how formula values of argument and functor nodes combine in a bottom-up manner with the rootnode showing the full propositional formula for the utterance *Mary kissed John: Fo*(Kiss')(John')(Mary').

(112) Tree structures with completed *Fo* values for *Mary kissed John*



Each node carries a semantic expression; no tree is complete until all nodes are decorated with a *Fo* value. As we will see, a *Fo* value for a node can be found from lexical input, i.e. from information projected by the lexical entry for a word (see Section 3.4.3 on lexical entries), or can be resolved contextually as is the case with pronouns which project an underspecified *Fo* value to be substituted with information from the context (see Section 3.4.3.2 on semantic underspecification).

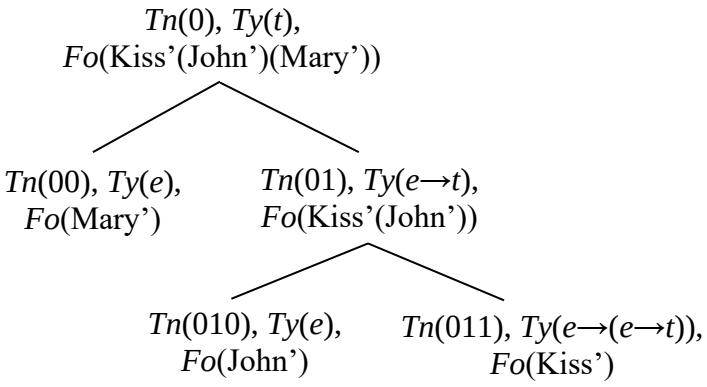
In addition to a formula value, each node carries a semantic type value represented with the predicate *Ty* which has the form *Ty*(*X*) where *X* ranges over possible semantic types. The basic semantic types used in DS are *t, e* and *cn*. Type *t* is an expression of a propositional type such as *Fo*(Run'(John')) for the string *John ran*, type *e* is a term that denotes some entity such as *Fo*(John') and *cn* is the type assigned to common nouns, for example *Fo*(*x*, Teacher'(*x*)). Functor nodes are represented as conditional statements of the from *e*→*t* which expresses a predicate type, i.e. when a one-place predicate (*e*→*t*) is combined with a term (type *e*) it yields a proposition (type *t*).

Table 6 Semantic types

Semantic type	Use:
***Ty*(*e*)**	Individual term (entity)
***Ty*(*t*)**	Proposition
***Ty*(*e*→*t*)**	One-place predicate
***Ty*(*e*→(*e*→*t*))**	Two-place predicate
***Ty*(e→(*e*→(*e*→*t*)))**	Three-place predicate
***Ty*(*cn*)**	Nominal
***Ty*(*cn*→*e*)**	Quantifier

In summary, a fully derived tree structure is one where each node has a fixed tree node address and carries a *Fo* value and *Ty* information. Throughout this thesis tree node address decorations are often omitted for clarity of discussion and tree structures are presented carrying only *Fo* and *Ty* values. A fully completed and annotated tree structure for the utterance *Mary kissed John* is illustrated in (113). It shows how information from the *Tn*(010) and *Tn*(011) nodes combines to yield a predicate (e→*t*) type with a complex *Fo* value – Kiss'(John'). Then, the *e*→*t* type expression at the *Tn*(01) node combines with the type *e* expression at the *Tn*(00) node to yield a propositional *t* type at the rootnode with the complex *Fo* value − Kiss'(John')(Mary').

(113) Fully annotated tree structure for the string *Mary kissed John*



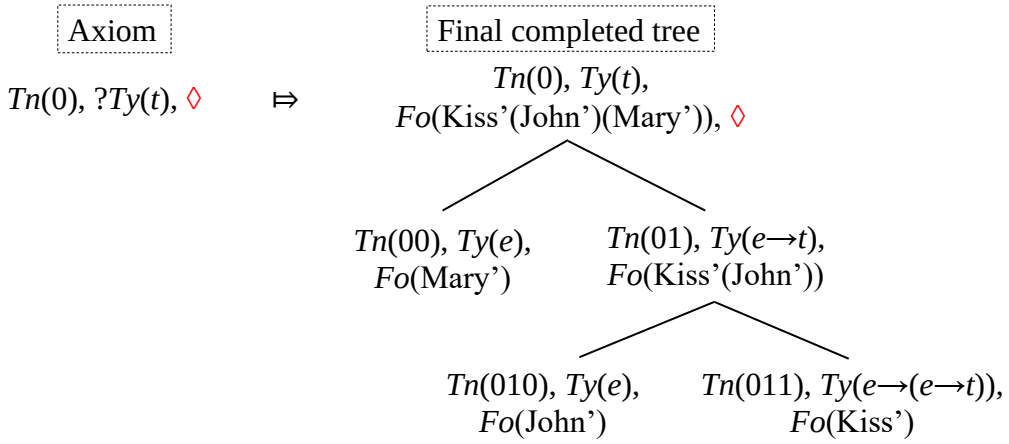
The tree in (113) shows the semantic structure of propositional content for the string of words *Mary kissed John*. It represents the final established interpretation for the string. Next, I turn to how trees are built incrementally. Section 3.4 turns to the dynamics of the tree-building process driven by a combination of computational rules, lexical input and retrieval of information from the context until a fully completed propositional tree structure is derived with all nodes associated with complete *Tn*, *Fo* and *Ty* values.

3.4 The tree-building process

3.4.1 Requirements and the pointer

The tree-building process is goal-driven; it starts with the expectation to derive a proposition. In DS this is called the axiom, i.e. the initial requirement at the onset of the parse to establish a propositional formula (see Cann et al. (2005) for motivation behind this assumption). Formally this is represented as ?*Ty*(*t*) where the question mark '?' stands for a requirement. The sketch in (114) shows the first step in the parsing process, the axiom, and the last step – the fully derived tree structure with no outstanding requirements.

(114) Parsing *Mary kissed John*: from start to finish



In between the initial requirement to establish an expression of type *t* at the start of the parse and the final tree where this requirement is satisfied, lie a series of transitional steps driven by a combination of computational rules, lexical input and contextual information. These transitional steps constitute the syntactic process in DS and form the basis for syntactic explanations. The symbol ◊ we see in the sketch in (114) is the pointer; it indicates the current node under development. Given the dynamic nature of the interpretation process, formalised in terms of a series of partial trees updated on a word-by-word basis, the pointer has a key role in acting as a tracking device indicating the current node under development. This means that not any node can be decorated at any time; the current position of the pointer is important as update of the partial tree can only proceed from the current node under construction.

Requirements are a key part of the tree-building process. A well-formed parse is one where the final tree has no outstanding requirements to be satisfied. Requirements take the form '?*X*' where *X* can be any tree node decoration to do with the tree node address of the node, its formula or type value. The annotation system allows many different combinations of requirements with modal statements, *Fo* and *Ty* values. Example requirements and their meanings are shown in Table 7 below, though these do not represent a comprehensive list of possible combinations. The annotation ?∃x.*Fo*(x) is a requirement projected by pronominal elements to find a formula value (see Section 3.4.3.2 on semantic underspecification). The decoration ?∃x.*Tn*(x) is associated with structural underspecification: it decorates a node whose tree node address is not yet established (see Section 3.4.2.6 on building nodes with no fixed address) and imposes the requirement that the node finds a *Tn* value. The ⟨*D*⟩ operator expresses a very weak tree relation; the requirement ?⟨*D*⟩*Fo*(*α*) plays the role in the construction of LINKed structures (Section 3.4.2.6) and it dictates that a copy of the formula value is to be found

in the emerging tree structure. The role of these requirements becomes clearer as I introduce computational rules and lexical actions.

Table 7 List of requirements

Requirement	Meaning
?*Ty*(*e*)	'the node is to be decorated with an expression of type *e* (a term)'
?*Ty*(*t*)	'the node is to be decorated with an expression of type *t* (a proposition)'
?*Ty*(*e*→*t*)	'the node is to be decorated with an expression of type *e*→*t* (a one-place predicate)'
?*Ty*(*e*→(*e*→*t*))	'the node is to be decorated with an expression of type *e*→(*e*→*t*) (a two-place predicate)'
?*Ty*(*e*→ (*e*→(*e*→*t*)))	'the node is to be decorated with an expression of type *e*→(*e*→(*e*→*t*)) (a three-place predicate)'
?∃*x*.*Fo*(*x*)	'find a formula value for the node'
?∃*x*.*Tn*(*x*)	'find a tree node address for the node'
?⟨*D*⟩*Fo*(*α*)	'find a copy of the formula value somewhere in the emerging tree'

3.4.2 Computational rules

As mentioned already, semantic trees 'grow' in three ways: through lexical input via actions projected by words and morphemes, computational rules and pragmatic enrichment. Here, I turn to computational rules, as defined in Cann et al. (2005). Computational actions are assumed to be universally available across languages, in contrast to lexical actions which are language-specific (these are introduced separately in Section 3.4.3). Computational rules make reference to the pointer; this means that they apply from the node that is currently under development. Formally, these are defined as in (115), with an *input line* which describes the current state of the tree under construction and positioning of the pointer, and an *output line* which gives a description of the tree and position of the pointer after the application of the rule.

While computational actions are optional, they cannot fire at any point – the input line is what ensures that a computational rule can be applied only in specific contexts.

(115) Computational rules

$$\frac{\text{Input line}}{\text{Output line}}$$

3.4.2.1 Introduction and prediction

The rules of INTRODUCTION and PREDICTION were first proposed for the analysis of English clause structure in Cann et al. (2005) to capture strict SVO word order. The parsing process starts with a tree with just one node carrying the requirement for an expression of type *t* – the axiom. The INTRODUCTION rule, shown in (116), applies when no other nodes are built (i.e. when there are no nodes under the type-*t*-requiring node). It splits the initial requirement ?*Ty*(*t*) into the subrequirements ?⟨↓$_0$⟩*Ty*(*e*) and ?⟨↓$_1$⟩?*Ty*(*e*→*t*). The INTRODUCTION rule does not build any nodes but only imposes the requirements that the type-*t*-requiring top node have an argument daughter of type *e* and a functor daughter of type *e*→*t*. The PREDICTION rule in (117), then, builds the daughter nodes, decorated with requirements for type values, leaving the pointer at the argument daughter node ready for the parse of the subject. The effect of the rules is the building of a fixed predicate-argument structure, shown in (118).

(116) The INTRODUCTION rule

$$\frac{\{\ldots\{Tn(n),\ ?\underline{Ty(t)}\ldots,\ \Diamond\}\ \}}{\{\ldots\{Tn(n),\ ?Ty(t),\ ?\langle\downarrow_0\rangle Ty(e),\ ?\langle\downarrow_1\rangle Ty(e\rightarrow t)\ldots,\ \Diamond\}\}}$$

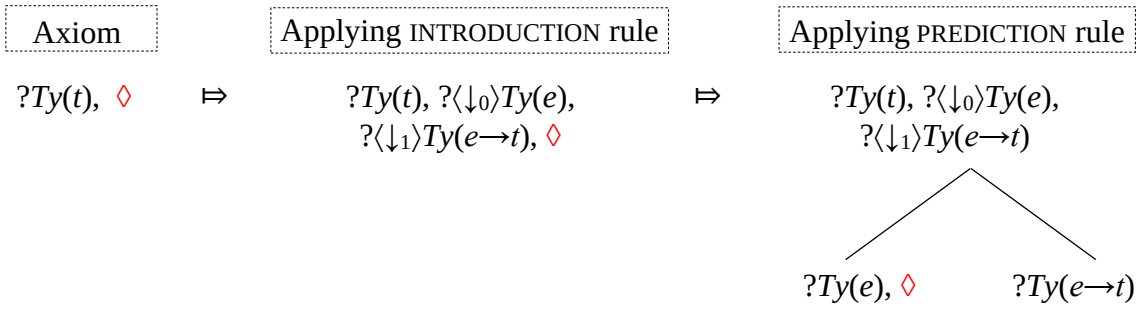
Input
Output

(117) The PREDICTION rule

$$\frac{\{\ldots\{\ldots Tn(n),\ ?\underline{Ty(t)},\ ?\langle\downarrow_0\rangle Ty(e),\ ?\langle\downarrow_1\rangle Ty(e\rightarrow t)\ldots,\ \Diamond\}\}}{\{\ldots\{Tn(n),\ ?Ty(t),\ ?\langle\downarrow_0\rangle Ty(e),\ ?\langle\downarrow_1\rangle Ty(e\rightarrow t)\ldots\}\{?Ty(e),\ \Diamond\}\{?Ty(e\rightarrow t)\}\}}$$

Input
Output

(118) Applying the INTRODUCTION and PREDICTION rules



Subsequent work, however, has proposed that the INTRODUCTION and PREDICTION rules do not take place in other languages. For example, in Japanese and Korean the full predicate-argument structure is projected by the verb, the reasoning being that both are fully pro-drop languages (Kempson & Kiaer, 2009a, 2009b; Kiaer, 2007). The rules are not applied for an analysis of Spanish (SVO) as well. As a subject pro-drop language, the lexical specifications of the verb construct the predicate-argument template (Bouzouita, 2008). In later work on English these rules are also dispensed with; see Cann (2011). This thesis follows these trends and does not apply the rules of INTRODUCTION and PREDICTION for the analysis of Hindi clause structure.

3.4.2.2 Thinning

The THINNING rule removes all satisfied requirements. As defined in (119), the input line shows a node carrying some tree node decoration *X*, as well as a requirement ?*X* for such a decoration.

Applying the rule results in the removal of the satisfied requirement, as shown in the output line.

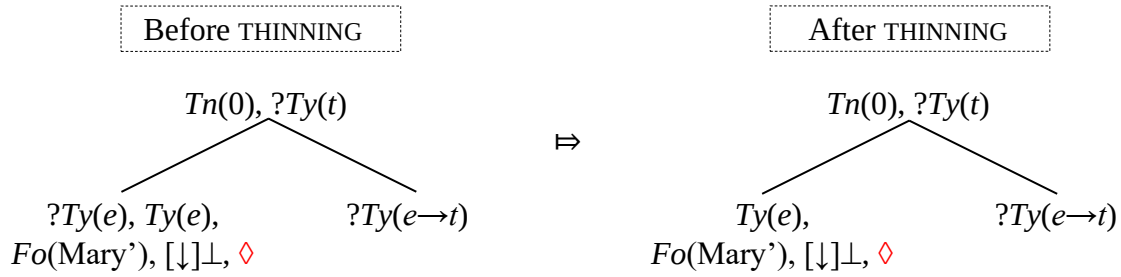
(119) The rule of THINNING

$$\frac{\{\ldots\{\ldots, X, \ldots, ?X, \ldots, \Diamond\}\ldots\}}{\{\ldots\{\ldots, X, \ldots, \Diamond\}\ldots\}}$$

Input
Output

The effect of applying the THINNING rule is illustrated in (120). In the first tree structure the pointer (◊) is at a node which carries both a requirement for an expression of type e, as well as a type e decoration. This allows for the THINNING rule to apply and remove the satisfied requirement, as shown in the second tree structure in (120).

(120) Applying the THINNING rule



3.4.2.3 Completion

The COMPLETION rule is given in (121). The input line states that when the pointer is at some daughter node ($\langle\uparrow_i\rangle Tn(n)$) with a satisfied type requirement ($Ty(X)$), it moves to the mother node ($Tn(n)$) and decorates it with information about the 'completed' daughter node ($\langle\downarrow_i\rangle Ty(X)$).

(121) The rule of COMPLETION

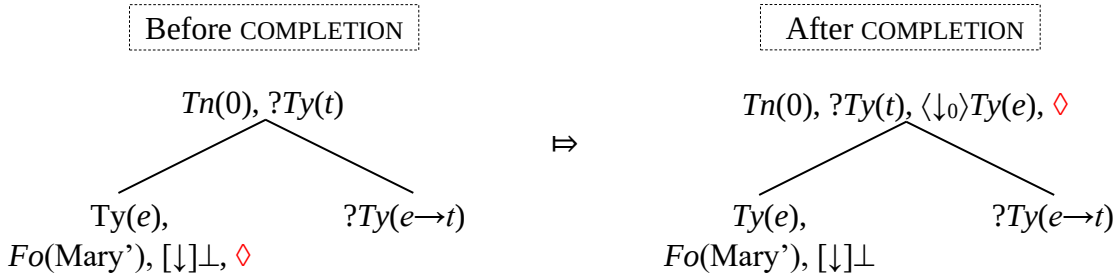
$$\frac{\{\ldots\{Tn(n)\ \ldots\},\ \{\langle\uparrow_i\rangle Tn(n),\ldots,\ Ty(X),\ \ldots,\ \Diamond\}\ldots\}}{\{\ldots\{Tn(n),\ \ldots,\ \langle\downarrow_i\rangle Ty(X),\ldots,\ \Diamond\},\ \{\langle\uparrow_i\rangle Tn(n),\ldots,\ Ty(X),\ \ldots\}\ldots\}}$$

Input
Output

where $i \in \{0, 1, *\}$

The effect of applying the rule is illustrated in (122). Before the COMPLETION rule applies the pointer is at the argument daughter node with all requirements satisfied. In this case the rule can apply (as per the input line). The pointer moves to the mother node and decorates it with information about the type value of its argument node – $\langle\downarrow_0\rangle Ty(e)$. For clarity of discussion, however, this decoration will often be omitted in tree structures (especially when not crucial for the analysis developed) to ensure that trees are easily read.

(122) Applying the COMPLETION rule



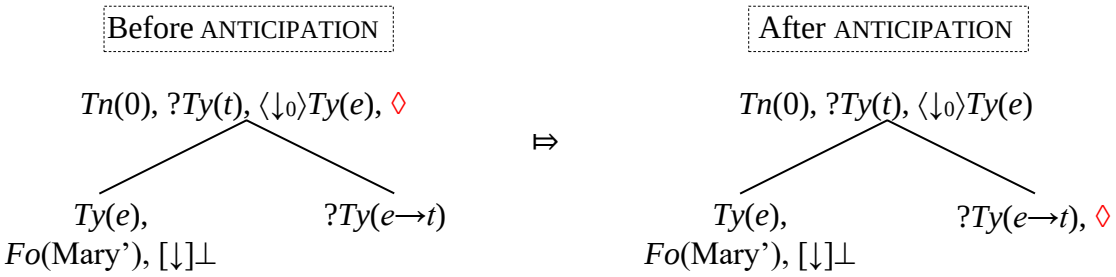
3.4.2.4 Anticipation

For English, the next step is the ANTICIPATION rule in (123). It applies when the pointer is at a mother node whose daughter has an outstanding requirement; this is defined in the input line. When applied, the pointer moves from the mother node to the daughter node with an unsatisfied requirement, as defined in the output line. This is illustrated in (124).

(123) The ANTICIPATION rule

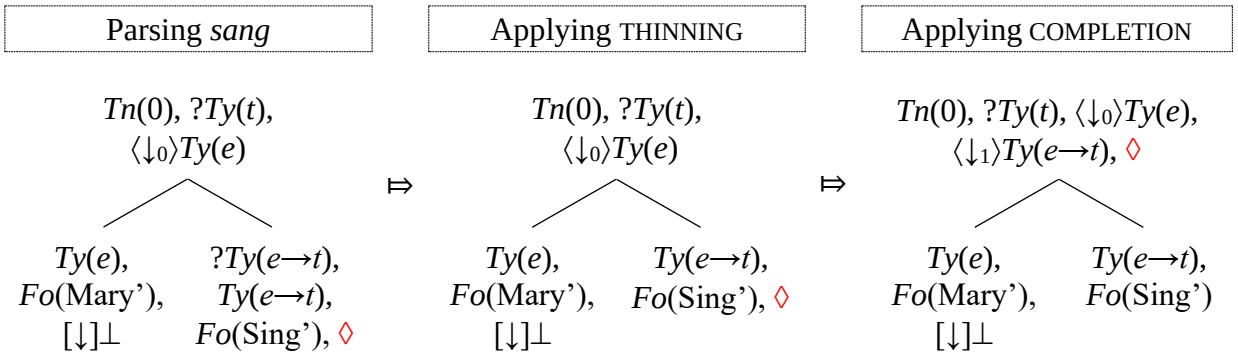
$$\frac{\{\ldots\{Tn(n), \ldots, \Diamond\}, \{\langle\uparrow\rangle Tn(n), ?X \ldots\}\ldots\}}{\{\ldots\{Tn(n), \ldots\}, \{\langle\uparrow\rangle Tn(n), ?X \ldots, \Diamond\}\ldots\}} \quad \begin{matrix}\text{Input}\\ \text{Output}\end{matrix}$$

(124) Applying the ANTICIPATION rule



At this point, the pointer is at the right place for the parse of an expression of type $e \rightarrow t$. The way the next step of the derivation is modelled is by scanning a lexical item such as *sang* (ignoring time and aspect for the time being). English verbs are parsed in the context of a requirement for type $e \rightarrow t$ (the details follow in Section 3.4.3.2). The emerging structure is given in (125) , after THINNING and COMPLETION.

(125) Parsing *sang* (ignoring tense and aspect)



3.4.2.5 Elimination and functional application

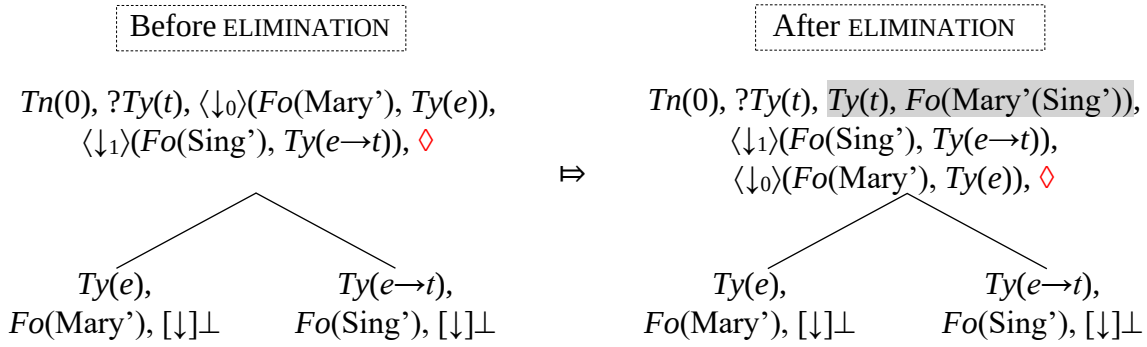
The ELIMINATION rule in (126) applies when the pointer is at a mother node whose daughter nodes have satisfied type and formula values. The sisters' formulae combine via FUNCTIONAL APPLICATION and their type values – via modus ponens (see Cann et al., 2005: 53). The effect of the rule is illustrated in (127). The mother node is annotated with the resulting formula and type values (highlighted in grey): *Ty*(*t*), *Fo*(Mary'(Sing')).

(126) The rule of ELIMINATION

$$\frac{\{\ldots\{Tn(n)\ \ldots\ ?Ty(X),\ \langle\downarrow_0\rangle(Fo(\alpha),\ Ty(Y)),\ \langle\downarrow_1\rangle(Fo(\beta),\ Ty(Y\rightarrow X))\ \ldots,\ \Diamond\}\ \ldots\}}{\{\ldots\{Tn(n)\ldots\ ?Ty(X),\ Fo(\beta(\alpha)),\ Ty(X),\ \langle\downarrow_0\rangle(Fo(\alpha),\ Ty(Y)),\ \langle\downarrow_1\rangle(Fo(\beta),\ Ty(Y\rightarrow X))\ \ldots,\ \Diamond\}\ \ldots\}}$$

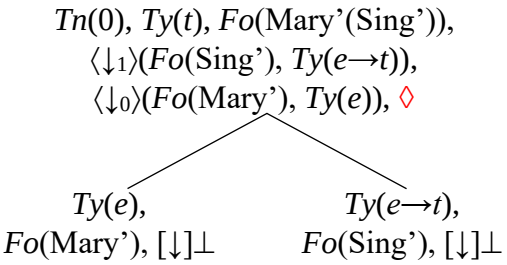
Condition: $\langle\downarrow_i\rangle ?\phi$, $i \in \{0, 1\}$, does not hold

(127) Applying the ELIMINATION rule



After the application of ELIMINATION the rootnode's requirement ?*Ty*(*t*) is satisfied and the THINNING rule can apply. This will give us a fully completed propositional tree structure in which all nodes are decorated with type and formula values and has no outstanding requirement.

(128) Completed propositional structure for *Mary sang*



A simplified sketch is given in Figure 1 to illustrate what is meant by the bottom-up fashion in which information 'combines' to derive a propositional formula, namely the process of FUNCTIONAL APPLICATION.

Figure 1 Functional application: Step 1

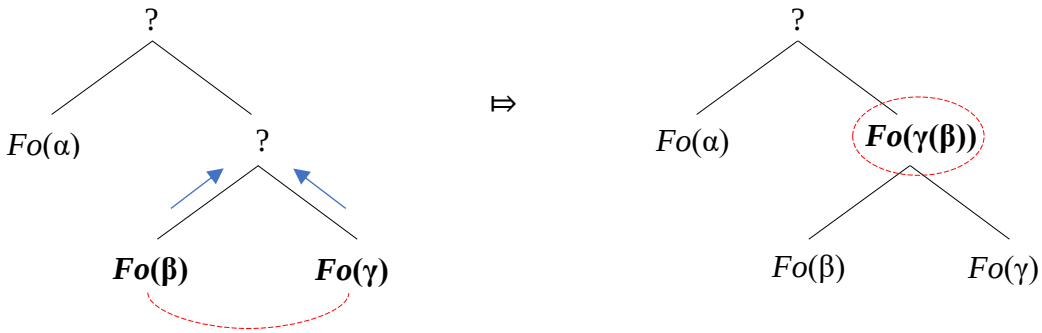
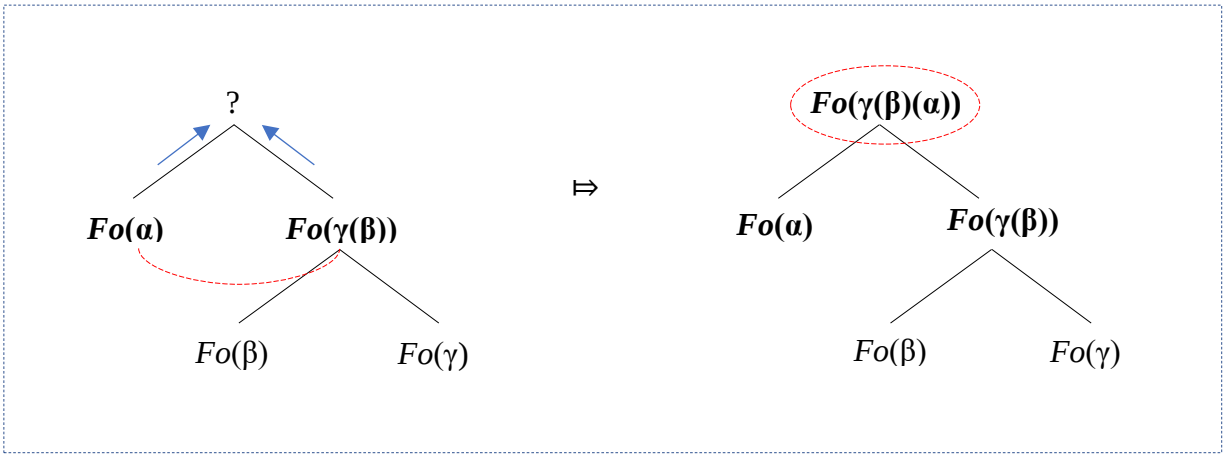


Figure 1 shows the stepwise process in which the *Fo* value of a topnode is derived. Once the formulas of the lowest argument and functor nodes are established (circled in the structure on the left), they combine via FUNCTIONAL APPLICATION to yield the formula of their mother node – *Fo*(γ(β)). Then, the same process continues upwards, as shown in Figure 2. The node carrying the decoration *Fo*(α) and its sister carrying *Fo*(γ(β)) yield via functional application the *Fo* value of their mother node –*Fo*(γ(β)(α)) (circled on the right).

Figure 2 Functional application: Step 2



The discussion so far has revolved around English examples. This is because the INTRODUCTION and PREDICTION rules are not applied for Hindi. These rules, however, have been rethought even for English, arguing that an initial subject is associated with structural underspecification, i.e. it is parsed onto an unfixed node (Cann, 2011, 2018). Underspecification is a key aspect of the DS formalism and I turn to computational rules that build unfixed nodes to parse lexical information whose exact tree node address is yet unknown. These rules are an essential part of the developed DS approach to Hindi clause structure as I assume that one of the strategies to parse a Hindi NP is via building an unfixed node.

3.4.2.6 Underspecification and update: *Adjunction rules and Merge

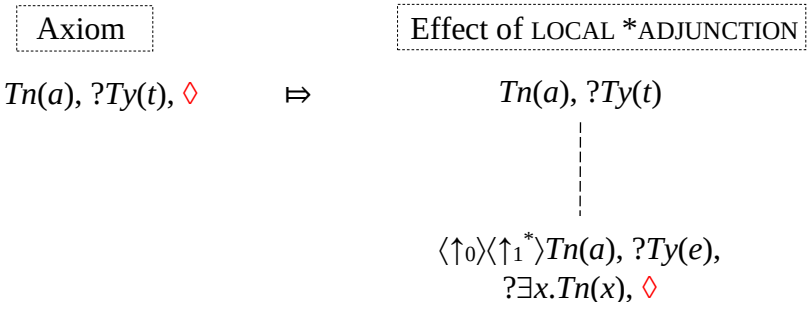
The concept of underspecification is central for the analysis of linguistic phenomena that allows preserving the DS dedication to incrementality of parsing. It refers to the manipulation of information that is in some sense incomplete at the time of parsing a lexical item until more information becomes available at a later stage of the process. There are several rules that build unfixed nodes: LOCAL *ADJUNCTION, *ADJUNCTION, LATE *ADJUNCTION and PREDICATE *ADJUNCTION. These are now introduced in turn.

The LOCAL *ADJUNCTION rule is shown in (129). The rule builds an unfixed node of type *e* decorated with the modality $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$ which ensures that the node is fixed within the local propositional domain. The effect of LOCAL *ADJUNCTION is given in (130). Starting from a node decorated with a requirement for type *t*, the pointer builds an unfixed node (indicated with a dashed line), moves there and decorates it with the following requirements: ?*Ty*(*e*) – a requirement that the node is decorated with an expression of type *e*, $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle$*Tn*(0) – a modal statement that the node is dominated by the *Tn*(0) node along an argument relation $\langle\uparrow_0\rangle$ and an unspecified number of functor relations $\langle\uparrow_1^*\rangle$, and ?$\exists x.$*Tn*(*x*) – a requirement that the tree node is to find a fixed location in the emerging tree structure.

(129) The rule of LOCAL *ADJUNCTION

$$\frac{\{\ldots\{Tn(a),\ldots,\ ?Ty(t),\ \Diamond\}\ldots\}}{\{\ldots\{Tn(a),\ ?Ty(t)\ldots\}\ \ldots\ \{\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a),\ ?Ty(e),\ ?\exists x.Tn(x),\ \Diamond\}\ldots\}}$$

(130) Applying the rule of LOCAL *ADJUNCTION

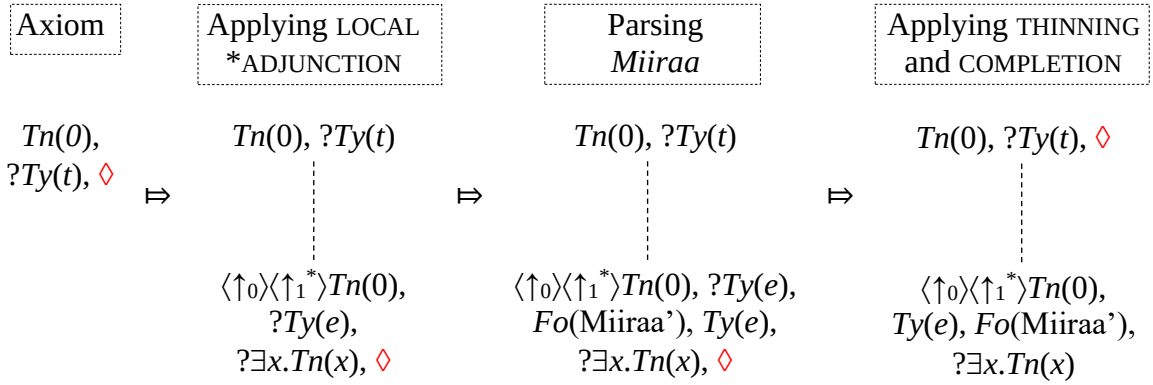


After the rule applies, the pointer is left at the type-*e*-requiring node which allows for an expression of type *e* to be parsed next. How the parse proceeds from the axiom for the parse of an initial NP via LOCAL *ADJUNCTION is illustrated in (132) for the utterance in (131), ignoring for now the details of the lexical actions projected by *Miiraa* (see Section 3.4.3). Parsing *Miiraa* projects a *Fo* value and a type *e* specification. This satisfies the requirement for an expression

of type *e* ?∃*x*.*Tn*(*x*) and the THINNING and COMPLETION rules can apply, leaving the pointer at the rootnode.

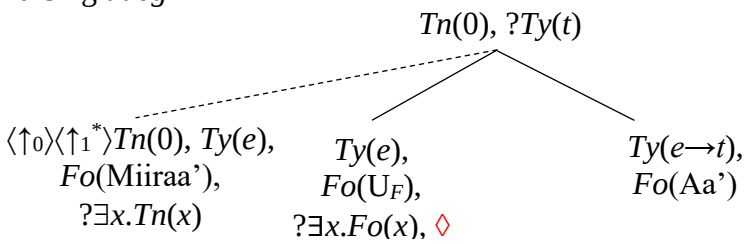
(131) Miiraa aa-egii
Mira.F come-FUT.F.3SG
'Mira will come.'

(132) Applying LOCAL *ADJUNCTION and parsing *Miiraa*



The pointer is left at the rootnode after COMPLETION from where it can parse the verb. The next step is illustrated in (133). The verb is assumed to project a full predicate-argument structure. The one-place predicate *aaegii* 'will come' builds a functor node of type *e*→*t* and decorates it with a formula value. It also builds type-complete argument node, decorated with a restricted formula value $Fo(U_F)$ and leaves the pointer there (a more detailed discussion on lexical actions projected by words follows in Section 3.4.3). Note that the verb projects a type *e* and not a requirement for type *e* as Hindi easily allows the drop of subject arguments. A requirement ?*Ty*(*e*) would necessitate the obligatory realisation of some NP as subject which does not capture the Hindi facts.

(133) Parsing *aaegii*



The formula value U_F is a placeholder that needs to find a value. The subscript $_F$, projected by gender morphology (*-ii*), stands for the presupposition 'female'. This ensures that the metavariable can only be substituted with a formula value that satisfies this presupposition. Lastly, the requirement ?∃*x*.*Fo*(*x*) states that a formula value is to be found for the node that carries it.

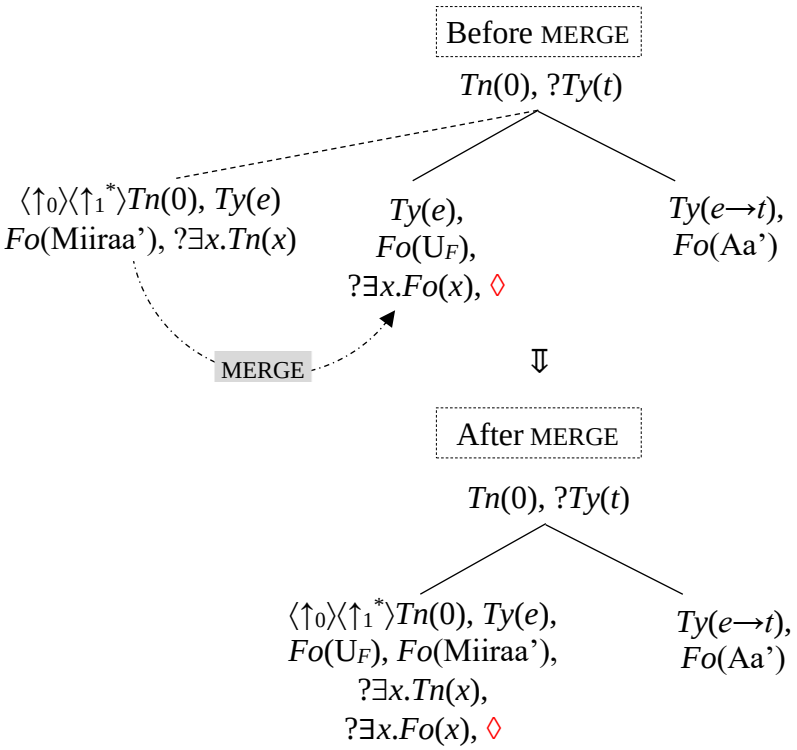
One strategy for the metavariable to find a contentful value is via the rule of MERGE (in subsequent sections I elaborate on other strategies for identifying a term for the subject argument). The rule of MERGE allows for unfixed nodes to find a treenode address via unifications of compatible treenode descriptions. The rule is given in (134).

(134) The MERGE rule

$$\frac{\{\ldots\{\ldots \text{DU}, \text{DU'} \ldots\}\ldots\}}{\{\ldots\{\ \ldots\text{DU} \sqcup \text{DU'} \ldots\}\ldots\}}$$
$$\Diamond \in \text{DU'}$$

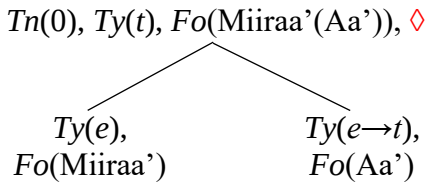
The snapshots in (135) show the effect of the application of the rule. After the two nodes unify, their decorations are accumulated on the fixed argument node.

(135) Applying the MERGE rule



Next, the THINNING rule can apply to eliminate the satisfied requirements. The requirement ?∃*x*.*Tn*(*x*) is satisfied as the node it is currently at has a fixed tree node address. The metavariable *Fo*(U_F) and the formula *Fo*(Miiraa') are compatible and the two collapse into one formula description, satisfying the ?∃*x*.*Fo*(*x*) requirement. After THINNING, the pointer moves to the mother node via COMPLETION. From there, ELIMINATION can take place to decorate the mother node with the combined type and formula values of the sister nodes. This satisfies the requirement ?*Ty*(*t*) at the rootnode and THINNING can take place, giving the final fully completed propositional structure in (136).

(136) Final completed tree for *Miiraa aaegii*



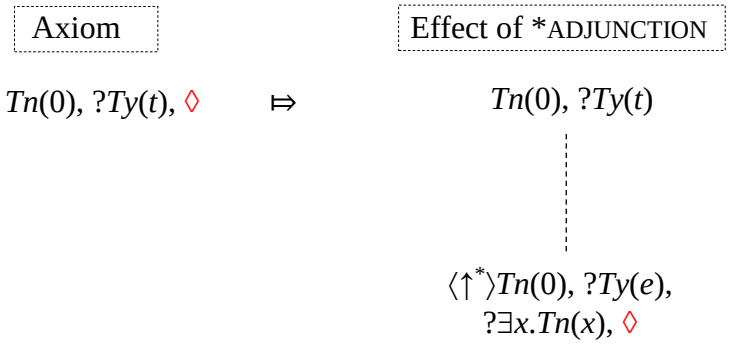
The *ADJUNCTION rule is shown in (137) and the effect of its application – in (138). As the LOCAL*ADJUNCTION rule, it builds an unfixed node decorated with a requirement for type *e* from a type-*t*-requiring node but a different modal statement. The ⟨↑*⟩*Tn*(0) statement requires that the node is dominated by the *Tn*(0) node under an unspecified number of tree node relations.

(137) The *ADJUNCTION rule

$$\frac{\{\ldots\{\{Tn(a),\ldots,\ ?Ty(t),\ \Diamond\}\}\ldots\}}{\{\ldots\{\{Tn(a),\ldots,\ ?Ty(t)\},\ \{\langle\uparrow^*\rangle Tn(a),\ ?\exists x.Tn(x),\ \ldots,\ ?Ty(e),\ \Diamond\}\}\ldots\}}$$

Input
Output

(138) Applying the *ADJUNCTION rule

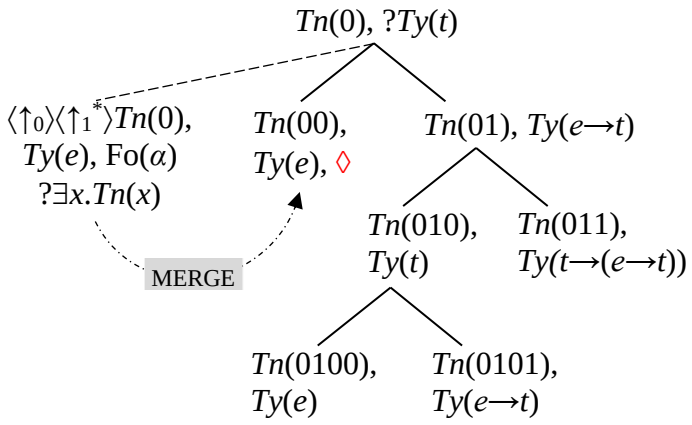


The distinction between *ADJUNCTION and LOCAL *ADJUNCTION is important as the system does not allow more than one unfixed node of a certain type to be present at the same time (Kempson & Kiaer, 2009a, 2009b). This is because nodes with identical tree node address

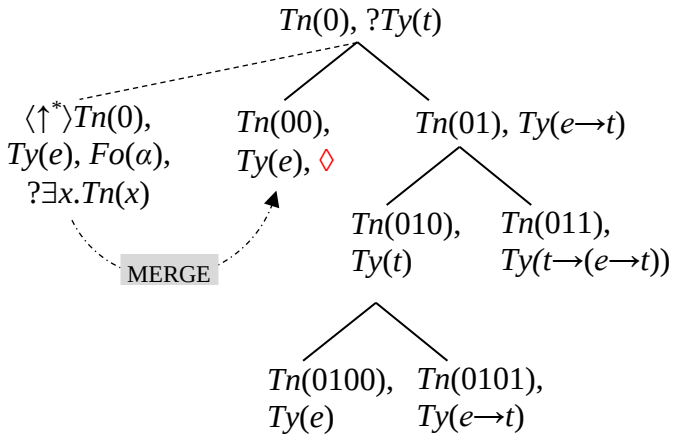
specifications will collapse into one. The $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Tn(a)$ modality introduced by the local variant of the rule ensures that the unfixed node finds a tree node address that satisfies the condition that the node is 'up' an argument relation and 'up' an underspecified number of functor relations (zero or more) from the top node $Tn(a)$. This allows for the locally unfixed node to MERGE with any of the argument nodes within the most local propositional structure, i.e. the type-*t*-requiring node from which the locally unfixed node is built. In the case of an unfixed node built via *ADJUNCTION, it can MERGE with an argument node within the local propositional structure or with an argument node down an embedded propositional structure. An illustration of MERGE points is sketched in (139).

(139) Unfixed nodes and possible MERGE points

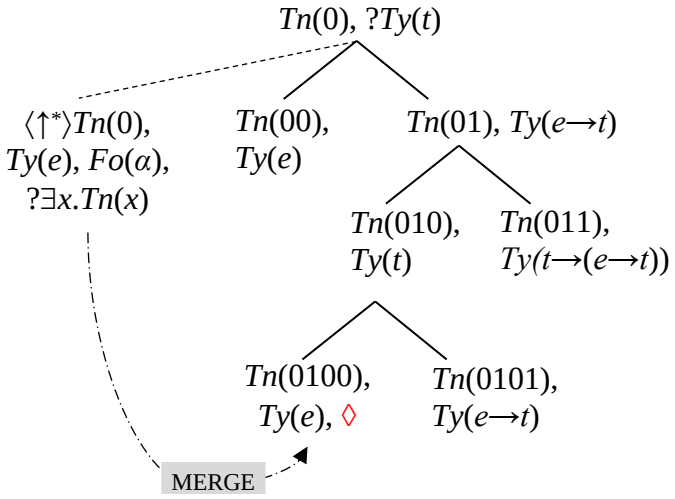
(a) Locally unfixed node merging with *Tn*(00)



(b) Unfixed node merging with *Tn*(00) node



(c) Unfixed node merging with *Tn*(0100) node



The sketched trees in (139) show a *Tn*(010) node of type *t* (an embedded complement clause). In (139)(a), the locally unfixed node can only merge with the *Tn*(00) node, as it is the only argument node of type *e* that satisfies the requirement $\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle Tn(0)$. The only other node of type *e* is the *Tn*(0100) node; the locally unfixed node cannot merge with it as its location in the tree structure involves more than one steps 'up' an argument relation to reach the top node

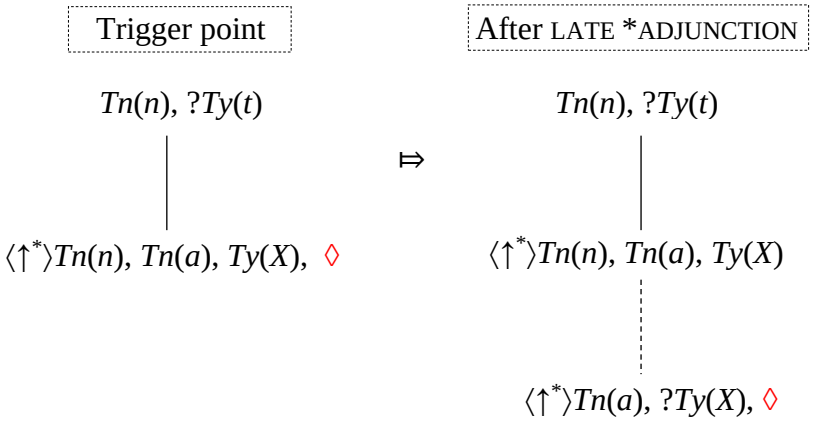
Tn(0). (139)(b) and (139)(c) show that the unfixed node built via *ADJUNCTION and carrying the weaker requirement ⟨↑*⟩*Tn*(0) can merge with either the *Tn*(00) or the Tn(0100) node.

An unfixed node can also be built via the rule of LATE *ADJUNCTION in (140). The difference with the other adjunction rules is that it builds an unfixed node of the same type as the node from which it is projected. This is illustrated in (141).

(140) The rule of LATE *ADJUNCTION

$$\frac{\{Tn(n),\ldots,\ \{\langle\uparrow^*\rangle Tn(n),\ Tn(a),\ \ldots,\ Ty(X),\ \Diamond\},\ \ldots\}}{\{Tn(n),\ldots,\ \{\langle\uparrow^*\rangle Tn(n),\ Tn(a),\ \ldots,\ Ty(X)\},\ \{\langle\uparrow^*\rangle Tn(a),\ ?Ty(X),\ \Diamond\},\ldots\}}$$

(141) Effect of the rule of LATE *ADJUNCTION



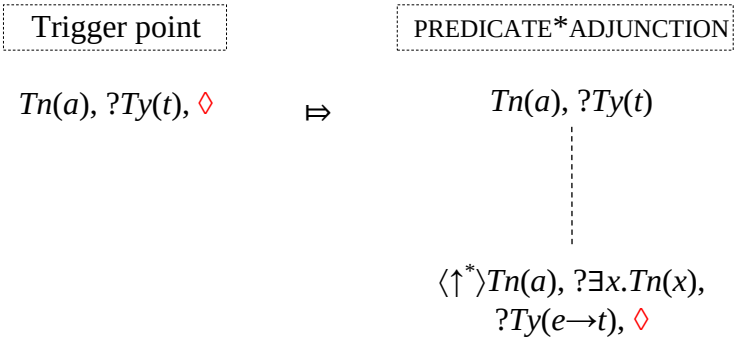
This rule is used for parsing postverbal material in Hindi, i.e. material that is 'delayed' and parsed after the verb has already built a full propositional template with complete type values.

Lastly, the rule of PREDICATE ADJUNCTION in (142) is introduced by Gibson (2012: 211) for the analysis of Rangi auxiliary constructions. The rule builds from a type-*t*-requiring node an unfixed node of type *e*→*t*. The effect of the application of PREDICATE ADJUNCTION is illustrated in (143).

(142) The rule of PREDICATE ADJUNCTION

$$\frac{\{\ldots\{\{Tn(a),\ldots,?Ty(t),\Diamond\}\}\ldots\}}{\{\ldots\{\{Tn(a),\ldots,?Ty(t)\},\{\langle\uparrow^{*}\rangle Tn(a),?\exists x.Tn(x),\ldots?Ty(e\rightarrow t),\Diamond\}\}\ldots\}}$$

(143) Effect of the rule of PREDICATE ADJUNCTION



Gibson (2012) introduces the PREDICATE ADJUNCTION rule to capture infinitive-auxiliary orders in Rangi where the infinitive is parsed onto an unfixed node of a predicate type. This is because the auxiliary can only be parsed in the context of an unfixed node (see also Chatzikyriakidis & Gibson, 2017; Gibson, 2018). In this thesis the rule will be used for the parse of Hindi verbal stems (see Section 3.4.3.3).

3.4.2.7 LINKed structures and substitution

The LINK ADJUNCTION rule enables the construction of parallel trees which are in an anaphoric relation to one another. Relative clauses, for example, are analysed as involving the construction of parallel LINKed trees which share semantic content (Cann et al., 2005; Kempson & Kurosawa, 2009; Marten, 2013; Marten & Kula, 2011; Seraku, 2013). The relative clause is parsed onto a tree of type *t* which is LINKed to a type *e* node in the 'main' propositional tree. LINKed structures are also employed for the processing of conditionals: the processing of the *consequent* results in one tree structure and the *antecedent* is parsed on a separate LINKed tree

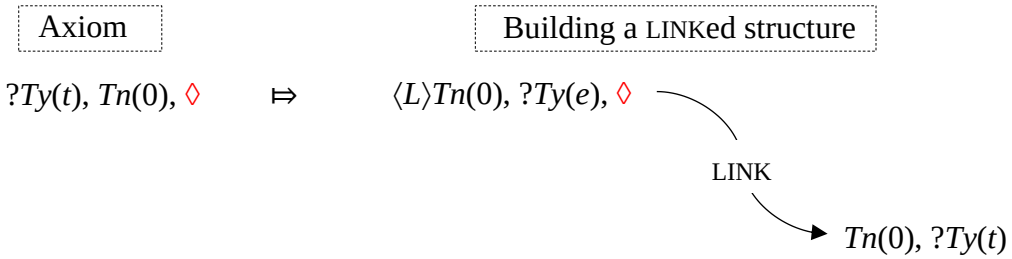
structure (Gregoromichelaki, 2011). Further, LINK structures are employed for parsing a left-peripheral topic expression. I will limit the discussion here to the use of LINKed structures for topic construal. The relevant rule is given in (144), following Cann et al. (2005).

(144) The TOPIC STRUCTURE INTRODUCTION rule

$$\frac{\{\{Tn(0), ?Ty(t), \Diamond\}\}}{\{\{Tn(0), ?Ty(t)\}\}, \{\langle L\rangle Tn(0), ?Ty(e), \Diamond\}}$$

The rule builds a LINKed structure from a type-*t*-requiring node, moves the pointer there and decorates it with a requirement for type *e*. The resulting structure is shown in (145).

(145) Building a LINKed structure from axiom

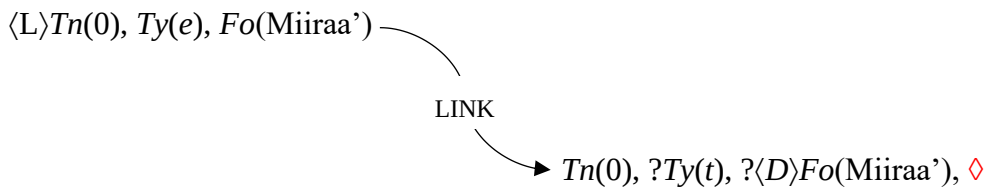


After the rule applies the pointer is left at the LINKed structure with a requirement for an expression of type *e*. This allows the parse of a proper name such as *Miiraa* of type *e* (as we will see in Section 3.4.3 proper names are parsed in the context of a type *e* requirement). Once *Miiraa* is parsed, the TOPIC STRUCTURE REQUIREMENT rule in (146) applies giving us the structure in (147). This rule moves the pointer to the main tree structure and imposes the requirement ?⟨*D*⟩*Fo*(Miiraa') which states that a copy of the term is to be found during the development of the tree. The ⟨*D*⟩ operator imposes a very weak structural restriction with no locality constraints as to the precise tree node address associated with the formula copy.

(146) The TOPIC STRUCTURE REQUIREMENT rule

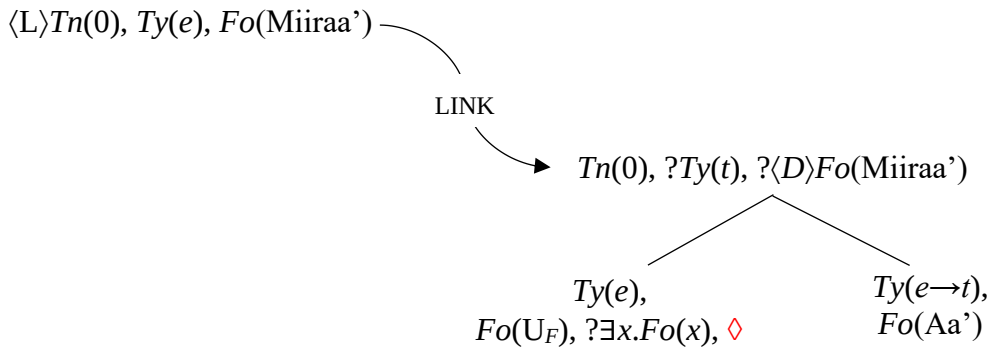
$$\frac{\{\{Tn(0), ?Ty(t)\}, \{\langle L\rangle Tn(0), Fo(\alpha), Ty(e), \Diamond\}\}}{\{\{Tn(0), ?Ty(t), ?\langle D\rangle Fo(\alpha), \Diamond\}\}, \{\langle L\rangle Tn(0), Fo(\alpha), Ty(e)\}}$$

(147) Building a LINK structure via the TOPIC STRUCTURE REQUIREMENT rule



In (147), the LINKed structure acts as the background against which the 'main' propositional tree structure unfolds. The pointer can proceed to parsing the verb *aaegii* 'will come' which unfolds the propositional template, leaving the pointer at the 'subject' argument node of type *e*.

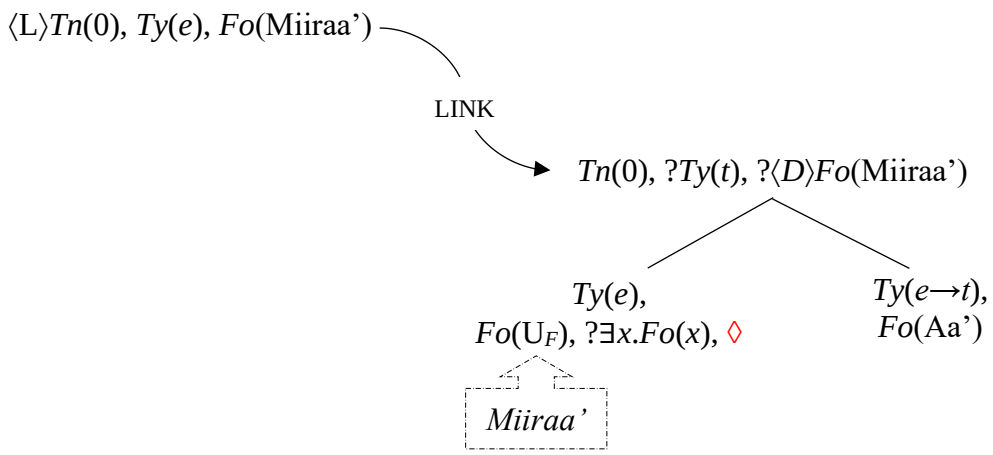
(148) Parsing *aaegii*



In this case the metavariable can find a value from the context via the pragmatic process of SUBSTITUTION (for a detailed discussion see Cann et al., 2005: Chapter 2). This process is also referred to as pragmatic enrichment. It involves the retrieval of an appropriate *Fo* value from the context for the substitution of a metavariable projected by a pronoun or – as in this case –

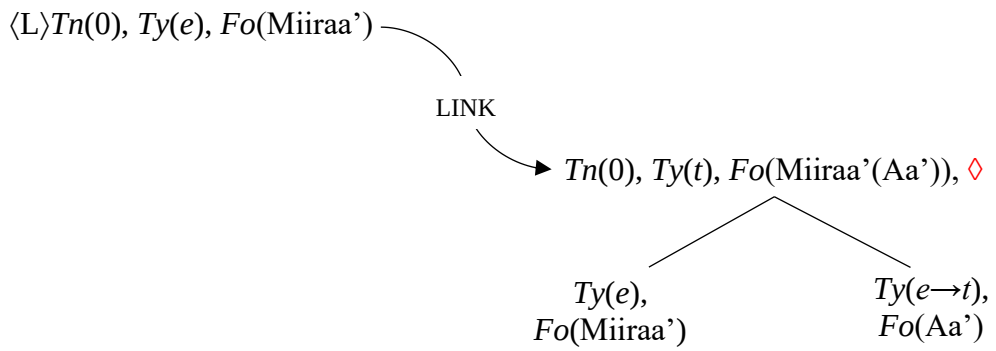
agreement marking. In (148), the LINKed structure acts as a context from which an appropriate *Fo* value can be retrieved to substitute the metavariable at the 'subject' node. This is illustrated in (149).

(149) Substituting metavariable with a value from the context



The substitution of the metavariable with the value *Miiraa'* satisfies the requirement ?∃*x*.*Fo*(*x*). Next, THINNING, COMPLETION and ELIMINATION take place, resulting in the tree structure in (150).

(150) Completed tree structure for the utterance *Miiraa aaegii*



LINK relations express an anaphoric dependency between two parallel structures. There are a number of other uses of LINKed structures (Cann, Kempson, & Otsuka, 2002). For example, relative clauses yield the construction of type *t* structures which are linked to a node of type *e* node from a parallel structures. They are used to model coordination as linked type *e* nodes (NP coordination) or linked type *t* nodes for sentential coordination. A further use are the so-called ethical datives where a dative NP is interpreted as only loosely related to the proposition. In this case, the NP is parsed onto a LINKed structure with no requirement that a copy of its formula value is found in the main tree (see Kempson, Cann, and Marten (2013)). This guarantees that it will not be interpreted as an argument of the proposition. In short, the flexibility of the DS model allows for a LINKed structure to be launched from a node of any type and any type of semantic content can be shared between tree structures.

In this section I have introduced computational rules which are assumed to be universally available. THINNING deletes satisfied requirements, COMPLETION moves the pointer to a mother node upon the completion of a daughter node, ELIMINATION decorates a mother node with the combined *Ty* and *Fo* values of its daughter nodes. I also introduced a set of rules which build unfixed nodes: LOCAL *ADJUNCTION builds a locally unfixed nodes of type *e,* *ADJUNCTION builds a less-restricted unfixed node of type *e*, LATE *ADJUNCTION builds an unfixed node of the same type as the type-complete node from which it is built and PREDICATE *ADJUNCTION builds an unfixed predicate node. Structural uncertainty is resolved via the rule of MERGE which leads to the unification of an unfixed node with a fixed node, provided their decorations are compatible. Lastly, I introduced the TOPIC STRUCTURE INTRODUCTION rule which builds a structure of type *e* LINKed to the 'main' propositional tree and the TOPIC STRUCTURE REQUIREMENT rule which imposes a requirement that the LINKed tree and the 'main' tree share a formula value. This is ensured with the rule of SUBSTITUTION which

pragmatically enriches an underspecified formula value with information from the LINKed structure. The processes of MERGE and SUBSTITUTION are thus different strategies for 'update' of some part of the unfolding propositional tree.

The building of unfixed nodes and LINKed structures constitute alternative parsing strategies which can be exploited to meet pragmatic goals. The expression of topic and focus is formally represented in the formalism as the interplay between universally available grammatical mechanisms and contextual information. LINKed structures are utilised to act as a 'constructed' context, i.e. as a point of departure against which an assertion is made (the so-called topic-comments structures discussed in Chapter 2). The building of unfixed nodes is a means for temporary retention of some information; in other words, the 'isolation' of some expression from the rest of the utterance. The effect is intuitions of emphasis or prominence of 'highlighted' information (see Chapter 6 for a detailed discussion and analysis).

I turn now to lexical entries which are the domain where typological differences across languages are captured. I will introduce the assumed lexical entries for Hindi nouns, verbal stems and verbal morphology. The motivation behind these assumptions becomes clearer as the discussion progresses in subsequent chapters of this thesis.

3.4.3 Lexical entries

Each lexical item is assumed to have a lexical entry which consists of directions on how the parse proceeds. Lexical entries constitute language-specific instructions expressed as a conditional statement following an IF THEN ELSE format, as shown in (151).

(151) The format of a lexical entry

Lexical item	IF	…
	THEN	…
	ELSE	…

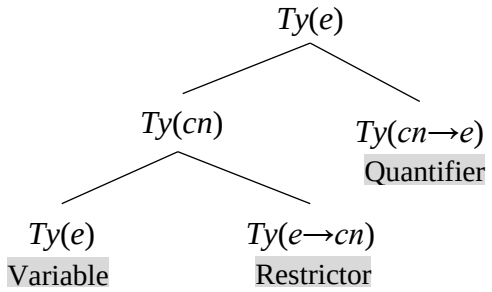
The IF part of the lexical entry contains a statement about the partial tree under development at the time of parsing the word; this is the 'trigger' or the condition under which the parse can proceed. If the statement is satisfied, the actions associated with the THEN part of the lexical entry take place. Otherwise, the ELSE part of the lexical entry is projected. Lexical actions are described with the predicates make(…), go(…) and put(…). The make(…) predicate builds a new node as per the instructions indicated in the brackets. For example, make($\langle\downarrow^0\rangle$) instructs to build an argument node from the current node. The predicate go(…) moves the pointer across tree nodes. For example, go($\langle\downarrow^0\rangle$) instructs the pointer to move down an argument relation from its current position. The put(…) predicate decorates the current node with annotations. For example, put(*Ty*(*e*)) instructs that the node is to be decorated with a type e value. These are illustrated in the discussion that follows.

3.4.3.1 The content of NPs

Dynamic Syntax employs the epsilon calculus first proposed by Hilbert and Bernays (1939) and later adapted in the works of Egli and von Heusinger (1995), Peregrin and von Heusinger (1995) and Meyer-Viol, Kempson, Kibble, and Gabbay (1999). Kempson et al. (2001) and Cann et al. (2005) argue that all noun phrases, whether quantified or not, are of type *e* (the type of a term) but project a complex internal structure with an operator, variable and restrictor nodes, as illustrated in (152). The internal structure, however, will often be omitted throughout this thesis in tree representations when not needed. The 'quantifier' node holds information

about the form of quantification. It combines with the type *cn* (common noun) node to yield the higher type *e* node. The lower type *e* node holds a variable for which the 'restrictor' node provides the binding domain.

(152) Structure of noun phrases

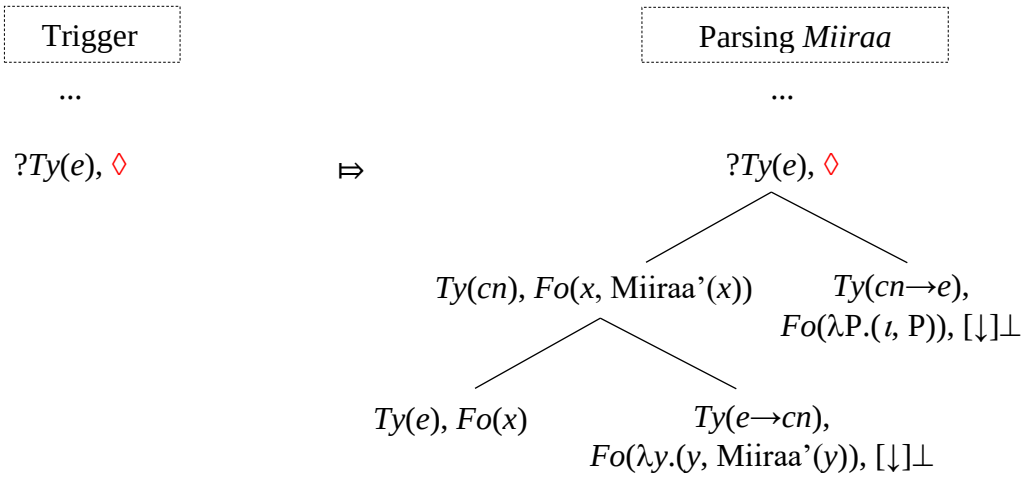


Proper names project a *iota* 'ι' term construed as an epsilon term picking out a unique witness. The lexical actions projected by *Miiraa* in (153) result in the structure in (154). The first line of the lexical entry specifies that only when the pointer (◊) is at a node decorated with ?*Ty*(*e*) the parse of *Miiraa* can proceed. Otherwise, the parse is aborted.

(153) Lexical entry of *Miiraa*

Miiraa	IF	?*Ty*(*e*)
	THEN	make(⟨↓$_1$⟩), make(⟨↓$_0$⟩), put(*Ty*(*cn*→*e*), *Fo*(λP.(ι, P)), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(Ty(*e*→*cn*), *Fo*(λ*y*.(*y*, Miiraa'(*y*)), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(*x*)), go(⟨↑$_1$⟩), go(⟨↑$_1$⟩)
	ELSE	Abort

(154) Internal structure projected by *Miiraa*



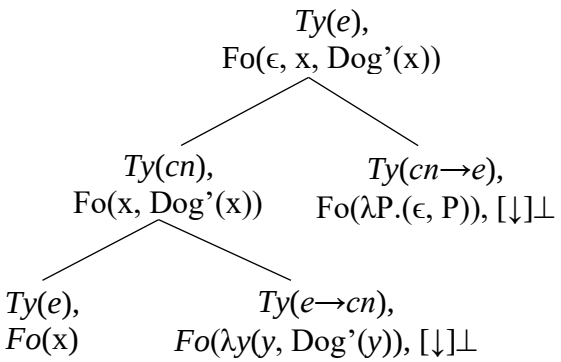
Starting from a requirement for an expression of type *e*, the parse of *Miiraa* builds and completes all internal nodes, leaving the pointer at the type-*e*-requiring node. At this point, as all information is completed at daughter nodes, the mother type *e* node is decorated via ELIMINATION with formula and type values: *Ty*(*e*), *Fo*(ι, *x*, Miiraa'(*x*)). This satisfies the requirement ?*Ty*(*e*) and the rule of THINNING applies.

When it comes to common nouns, there are two term-forming operators: the epsilon (ϵ) operator and the tau (τ) operator, equivalent to existential and universal quantifier, respectively. Here I will discuss only the epsilon (ϵ) operator and epsilon terms (ϵ-terms). To give an illustration of the formulation of an epsilon term, see (155).

(155) Epsilon term: ϵ, *x*, Dog′(*x*)

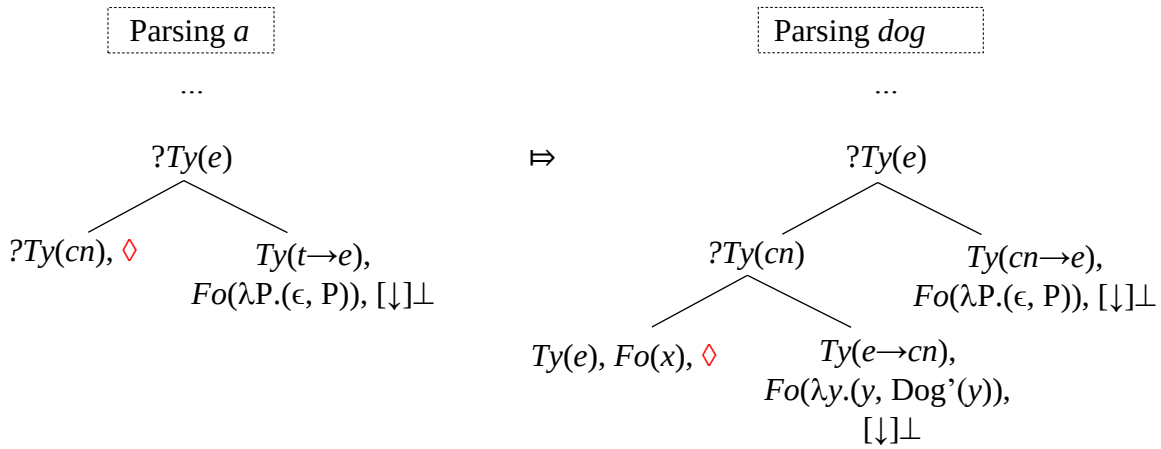
The epsilon term *Fo*(ϵ, *x*, Dog′(*x*)) picks an arbitrary witness of the set denoted by the predicate restrictor Dog', if the set is not empty. If the restrictor set (the set of dogs) is empty, the ϵ-operator picks out an arbitrary entity as a witness (Cann et al., 2005: 109). For English an epsilon term such as (156) is projected by an indefinite NP such as *a dog*.

(156) NP internal structure



The structure in (156) is derived in a step-by-step manner. The indefinite determiner in English builds the 'quantifier' node and decorates it with a variable-binding epsilon (ϵ) term (for existential quantification), leaving the pointer at the internal type-*cn*-requiring node. The common noun, then, builds the 'restrictor' node decorated with a complex lambda term which binds the variable introduced in the internal type *e* node (see Cann et al., 2005: Chapter 3 for details). This is illustrated in (157).

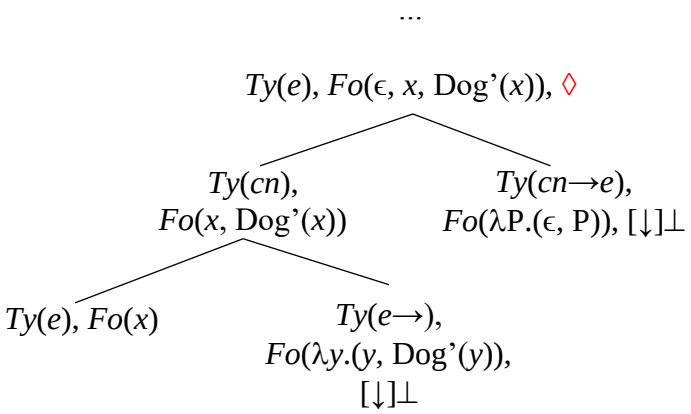
(157) Parsing *a student*



The noun *dog* projects a variable as *Formula* value and a restrictor which together construct the domain over which the epsilon term quantifies. Via the rules of COMPLETION and ELIMINATION the pointer moves from the bottom *Ty*(*e*) node to the *Ty*(*cn*) node to yield the

Formula decoration *x*, Dog'(*x*). The pointer then proceeds to move to the top *e* node via computational rules, satisfying requirements along the way. The epsilon operator ϵ together with *x*, Dog'(*x*) gives us the term ϵ, *x*, Dog'(*x*) which denotes some individual that satisfies the predicate Dog'. The completed type *e* internal structure is derived, repeated from (156) bellow:

(158) Finishing off via computational rules



Epsilon terms, however, are only fully specified after they are evaluated with respect to some full propositional content. Thus, the term ϵ, x, Dog′(x) is only a partial specification (a proto-term) as it undergoes an evaluation step to ensure that the full content of the final propositional formula is reflected.[14] For example, parsing a sentence such as *A dog barked* leads to deriving the propositional formula in (159)(a). This is then transformed by an evaluation algorithm (see the details in Cann et. al., 2005: 131) to the formula in (159)(b) where the epsilon term ϵ, x, Dog'(x) ∧ Bark'(x) (for 'there is some dog that barked') is the argument of the predicates Dog' and Bark'. The derived formula can be simplified as in (159)(c) where α is an abbreviation for the epsilon term which denotes a witness of the set of dogs that barked.

[14] However, I will not discuss scope evaluation rules and will not represent scope dependencies here (for this see Cann et. al., 2005: 123-134).

(159) Parsing *A dog barked*

(a) Bark'(ϵ, x, Dog'(x))

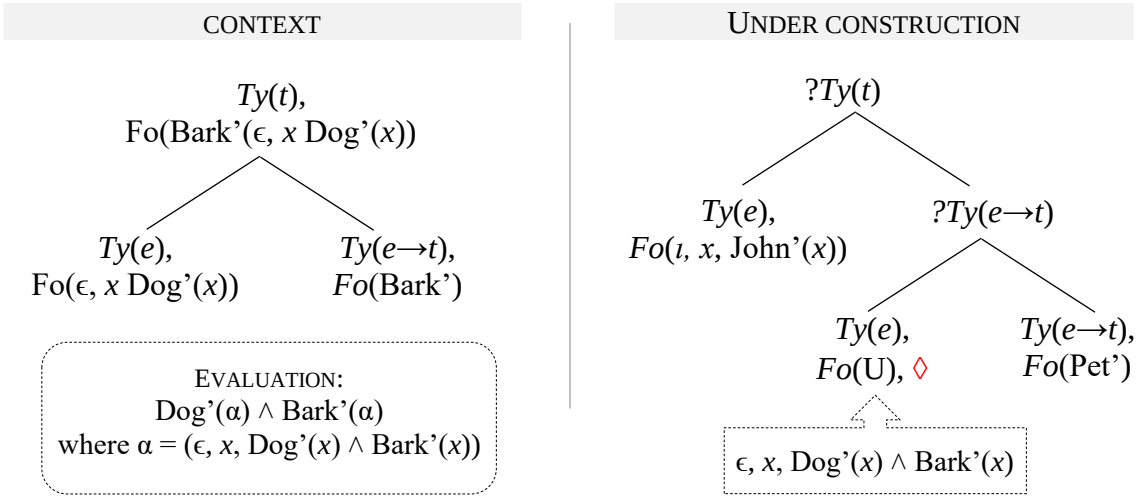
(b) Dog'(ϵ, x, Dog'(x) ∧ Bark'(x)) ∧ Bark'(ϵ, x, Dog'(x) ∧ Bark'(x))

(c) Dog'(α) ∧ Bark'(α), where α = (ϵ, x, Dog'(x) ∧ Bark'(x))

The effect of such an approach to term construal is that epsilon terms evolve, keeping track of the contexts in which they occur. This allows a straightforward account of anaphora: the epsilon term α for some dog that barked can serve as a referent to be picked up by an anaphoric expression realised in subsequent discourse.

In DS the interpretation of anaphoric expressions (demonstratives, definite NPs, pronouns) involves a pragmatic process by which a term constructed in context is copied to provide a value for the anaphoric expression (the process of SUBSTITUTION, as discussed in Chapter 3). To give an example, consider (160).

(160) A dog barked. John petted it.



The first sentence in (160) *A dog barked* yields the propositional structure on the left and acts as a context against which the second sentence is parsed. The pronoun *it* of the second sentence

finds as a value not just the individual term ϵ, x, Dog'(x) but exactly the epsilon formula 'there is some dog that barked'. The tree structure on the right shows a snapshot of the derivation at the point of the pragmatic process of SUBSTITUTION. After the object node has found a value, the pointer can move up to the root node satisfying requirements along the way. The derived propositional formula value after parsing the second sentence in the context of the first sentence is given in (161)(a) for 'John petted some dog that barked'. After evaluation, the epsilon formula in (161)(b) is established for 'there is some dog that barked and John petted'.

(161) Parsing *John petted it*

(a) Propositional formula: Pet'(ϵ, x, Dog'(x) ∧ Bark'(x))(ι, y, John'(y))

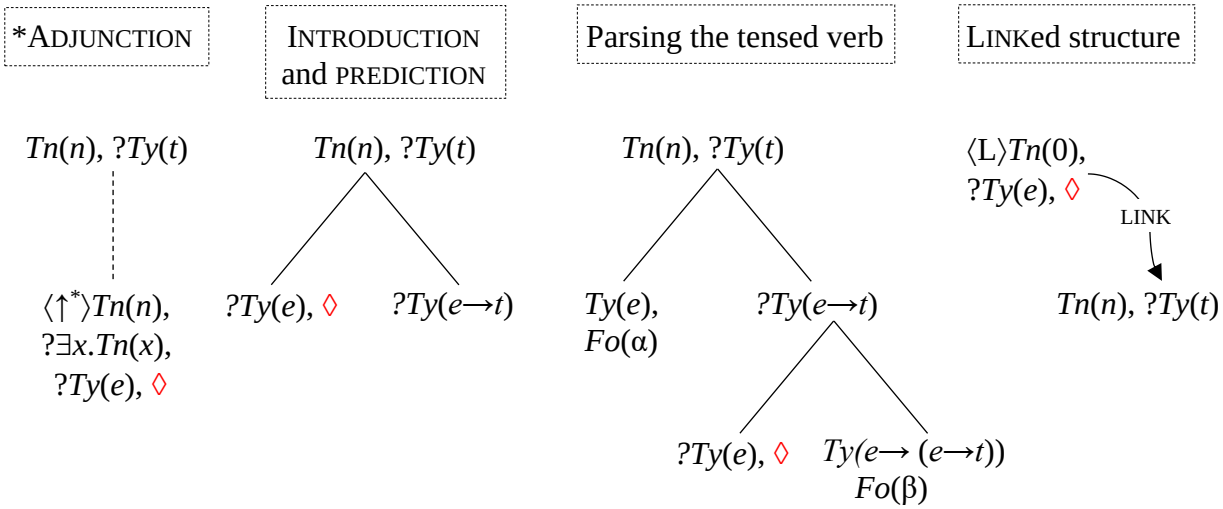
(b) Evaluated formula: Dog'(α) ∧ Bark'(α) ∧ Pet'(α)(ι, y, John'(y))
where α = (ϵ, x, Dog'(x) ∧ Bark'(x) ∧ Pet'(x)(ι, y, John'(y)))

Epsilon terms, thus, are constantly evolving in discourse reflecting their contextual occurrences as they get progressively enriched. The construal of anaphoric expressions involves the copy of a term construed in the context. Demonstratives and definite NPs are modelled similarly to pronouns: these expressions find an epsilon formula from the context. The difference is that the common noun acts as a restrictor to possible values when used in combination with a demonstrative or definite article.

As already shown, the trigger for parsing an NP is a requirement for an expression of type *e*. This ensures that an NP is parsed only when the pointer is at type-*e*-requiring node; otherwise, the parse is aborted. In English, as we saw in Section 3.4.2, this requirement can be met with the prior projection of an unfixed node decorated with a requirement ?*Ty*(*e*) or by building a fixed 'subject' argument node with a requirement ?*Ty*(*e*) via the rules of INTRODUCTION and PREDICTION. Another option is the projection of a LINKed structure at the onset of the parse. For the parse of objects, transitive verbs project a fixed predicate structure

complete with an internal argument node carrying a requirement *?Ty*(*e*). These options are summarised in (162), showing the different contexts in which an English expression of type *e* can be parsed.

(162) Parsing English nouns: possible trigger points



For Hindi, I assume two possibilities for the parse of a proper name: an unfixed node (via *ADJUNCTION or LOCAL *ADJUNCTION) or a LINK structure, thus keeping the requirement for an expression of type *e* as the initial trigger in the lexical entry for a proper name such as *Miiraa*. Following current developments, the rules of INTRODUCTION and PREDICTION are not employed.

When it comes to common nouns, the challenge that Hindi poses is that it lacks a specialised definite or indefinite article and bare common nouns are associated with a range of readings. In English the noun builds only a partial epsilon term, the binder being projected by the indefinite article. This means that for languages like Hindi, which lack an English-style indefinite article, the bare noun alone projects the whole epsilon term. Chapter 4 takes a closer look at nominal interpretation in Hindi and explores the context-dependence of the interpretation of common nouns, as well as their use in combination with the numeral *ek* and

the demonstrative *vo*. Based on the observations made, the chapter takes first steps towards a DS account of nominal interpretation and term construal in Hindi.

3.4.3.2 Semantic underspecification and metavariables

Pronouns project a metavariable in need of SUBSTITUTION from the context. This is referred to as semantic underspecification in the DS framework. The lexical entry for the first person singular pronoun in Hindi *maiN* is given in (163).

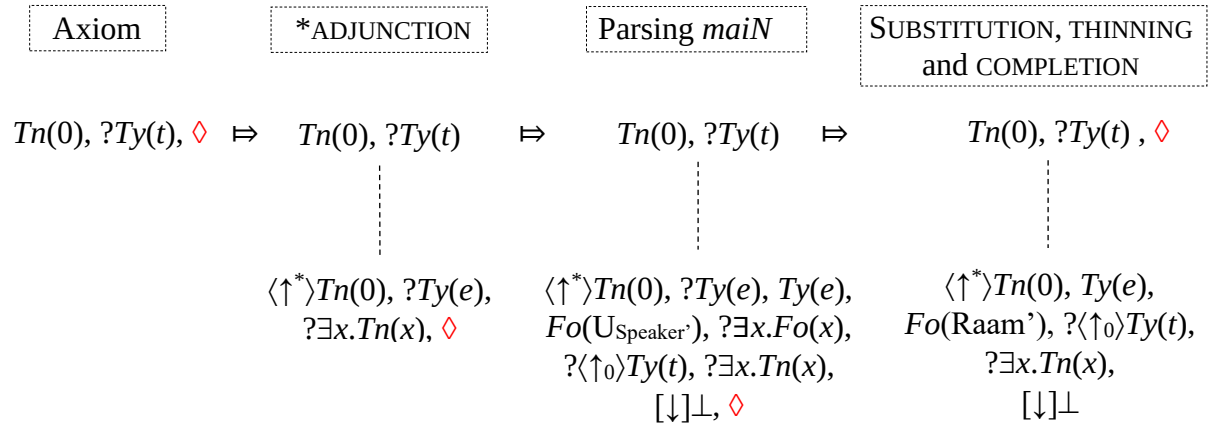
(163) Lexical entry for *maiN*

maiN	IF	?*Ty*(*e*)
	THEN	put(*Ty*(*e*), *Fo*($U_{Speaker'}$), ?∃*x*.*Fo*(*x*), ⟨↑$_0$⟩*Ty*(*t*), [↓]⊥);
	ELSE	Abort

The lexical entry states that if the pointer is at a type-*e*-requiring node, it decorates it with a type value *Ty*(*e*), a restricted metavariable $U_{Speaker'}$, a requirement ?∃*x*.*Fo*(*x*) that a *Fo* value is established, a requirement ?⟨↑$_0$⟩*Ty*(*t*) that the node is the immediate daughter of a node of type *t* and a bottom restriction [↓]⊥. The requirement ?⟨↑$_0$⟩*Ty*(*t*) is in essence a case condition; it reflects the fact that *maiN* is the nominative form of the pronoun and it cannot find any tree node address. It has to be immediately dominated along an argument relation by a node of type *t*. This is informally referred to as the 'subject' node. However, nodes in DS trees are not inhabited by words but by concepts and the grammatical functions of subject and object do not play a role in the analysis. For the utterance in (164) the parse of *maiN* yields the structure in (165):

(164) maiN bol rah-aa th-aa
1SG speak PROG-M.SG be.PST-M.SG
'I was speaking.'

(165) Parsing *maiN*



Starting from the axiom, an unfixed node is built with a requirement for type *e*. This provides the trigger for the parse of the pronoun *maiN* as per its lexical entry in (163). The lexical actions projected by *maiN* annotate the node with a type value, a restricted metavariable, a requirement for a *Fo* value, as well as a requirement for a position in the tree that is the immediate argument daughter of a node of type *t*. Next, the SUBSTITUTION process replaces the metavariable with a logical term which satisfies the presupposition that this is the speaker (in this case – *Raam*). Via THINNING and COMPLETION the pointer moves back to the top node, yielding the final structure in (165). At this point, the pointer is ready for the parse of the verb.

Chapter 4 explores in more detail the dual function of *vo* as a third person pronoun (166) and a demonstrative/determiner (167). Its pronoun use involves the projection of a metavariable which finds a value from the context. Similarly, in (167) *vo* also projects a metavariable but what this metavariable can be substituted with is restricted by the common noun. Formally this can be represented as the formula specification $Fo(U_{LaRkii'})$ where U has to be substituted with a term that satisfies the restrictor *LaRkii'*:

(166) vo aa-egii
3SG come-FUT.F.3SG
'He/she will come.'

(167) vo laRkii aa-egii
3SG.DIST girl.F come-FUT.F.3SG
'That girl will come.'

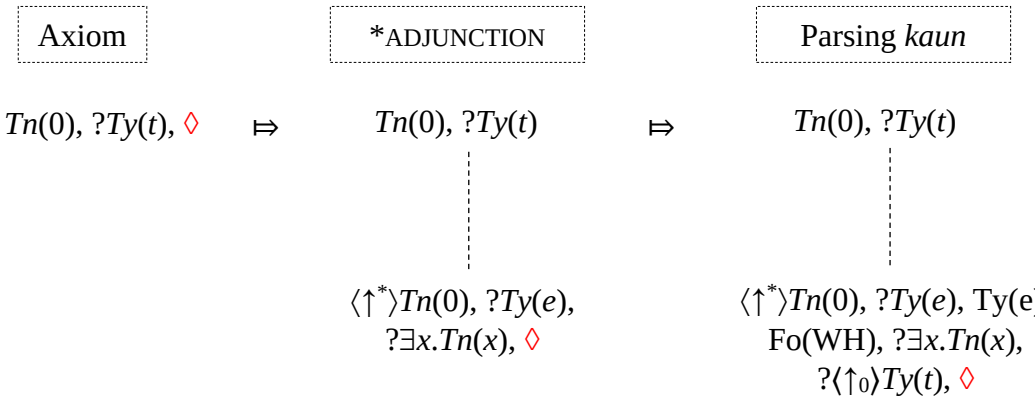
SUBSTITUTION is not the only way for a metavariable to be replaced by a term. An unfixed *Fo*-complete node can MERGE with a node carrying a metavariable. For example, as we will see shortly, Hindi tensed verbs project fixed argument nodes decorated with metavariables. Unfixed nodes carrying a *Fo* value can MERGE with such a node which leads to the unification of annotations.

Along with pronouns and demonstratives/determiners, *wh*- question words also project a metavariable. The difference is that they project a specialised metavariable which does not come with a requirement for finding a formula value (Kempson et al., 2016). The lexical entry for *kaun* 'who' is given in (168). It holds the condition that the parse can continue if the pointer is at a node with a requirement for type *e* and which is in an unspecified relation to the topnode (i.e. unfixed). The sequence of actions for the parse of *kaun* is given in (169).

(168) Lexical entry of *kaun*

kaun	IF	?Ty(e) ∧ ⟨↑*⟩*Tn*(*n*)
	THEN	put(Ty(e), *Fo*(WH), ?⟨↑$_0$⟩*Ty*(*t*));
	ELSE	Abort

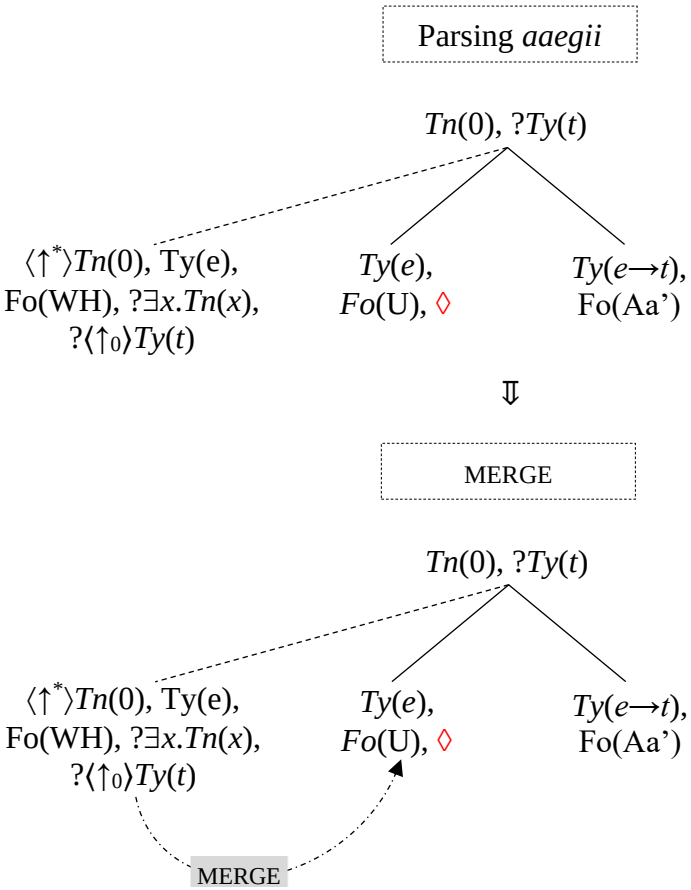
(169) kaun aa-egaa
who come-FUT.M.3SG
'Who will come?'



Starting from the axiom, an unfixed node is built via the rule of *ADJUNCTION. The pointer is at the right place for the parse of *kaun* which – as per its lexical entry – decorates the node with a type *e* specification, a metavariable and a requirement that the unfixed node finds such a tree node address that it is the immediate argument daughter to a node of type *t* (?⟨↑$_0$⟩*Ty*(*t*)). This captures the observation that *kaun* 'who' asks about the agent of the clause. The derivation then continues with the application of THINNING and COMPLETION, which leaves the pointer at the topnode, ready for the parse of a verb. The verb projects a fixed argument-predicate structure and a metavariable at the 'subject' node, as shown in (170). The unfixed node merges with the 'subject' node, thus unifying their decorations. The metavariable projected by the verb is substituted with the specialised WH metavariable; it is assumed that the presence of the WH metavariable satisfies the requirement that the node finds a *Fo* value. This is because the

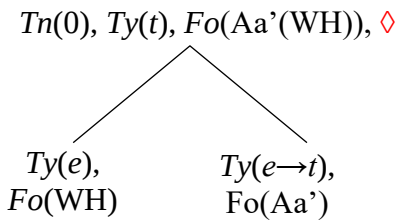
WH metavariable projected by a *wh-* question word does not come with a requirement that a *Fo* value is determined and the parse can be successfully completed.

(170) Parsing *kaun aaegaa*



After the unification of the nodes, as usual the satisfied requirements are deleted via THINNING and the pointer moves to the topnode node via COMPLETION. At the topnode ELIMINATION applies to decorate the node with the combined *Ty* and *Fo* values of its daughter nodes. The final completed structure is given in (171).

(171) Completed propositional tree structure for *kaun aaegaa*



The derived propositional formula for the question *kaun aaegaa* is *Fo*(Aa'(WH)). This is in keeping with semantic approaches which treat *wh*- questions as open propositions of the form 'x will come' (see Chapter 2).

3.4.3.3 The event term and the contribution of verbs

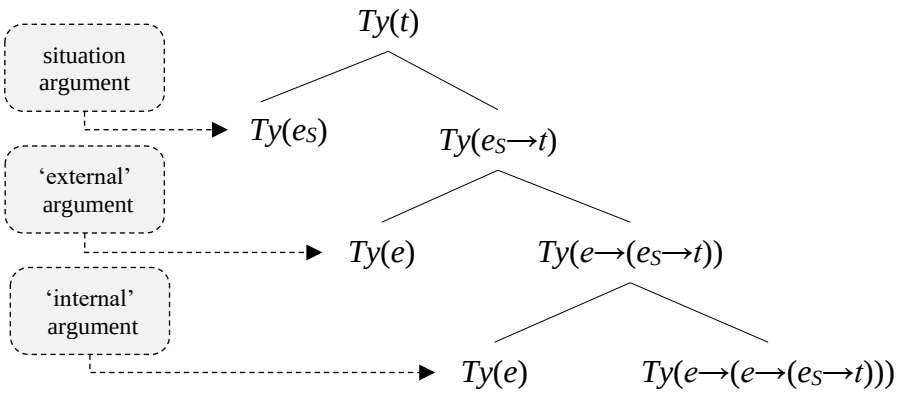
The discussion so far has not made mention of the event term e_S for simplicity of illustration. However, the event term plays a role in the analysis and particularly in the developed account of the ergative pattern in Hindi (Chapter 5).[15] The event term e_S was first introduced by Gregoromichelaki (2006) for a DS analysis of conditionals. The introduction of the event term means that types projected by verbs need to be modified to reflect an additional slot in the tree structure for the situation argument. Table 8 shows a comparison for illustrative purposes and (172) shows the modified tree structure to include an event node.

[15] The situation argument of a predicate is of type Ty(eS). Ty(e) is a general type with the subtypes Ty(eS) for situations and Ty(ei) for individuals. However, I continue to notate the type of individuals without the subscript (i.e. Ty(e)) for simplicity.

Table 8 Semantic types (revisited)

Semantic types		**Use:**
Without event node	**With event node**	
-	$Ty(e_S)$	Event term
$\boldsymbol{Ty(e)}$	$Ty(e)$	Individual term (entity)
$\boldsymbol{Ty(t)}$	$Ty(t)$	Proposition
$\boldsymbol{Ty(e\rightarrow t)}$	$Ty(e\rightarrow(e_S\rightarrow t))$	One-place predicate
$\boldsymbol{Ty(e\rightarrow(e\rightarrow t))}$	$Ty(e\rightarrow(e\rightarrow(e_S\rightarrow t)))$	Two-place predicate
$\boldsymbol{Ty(e\rightarrow(e\rightarrow(e\rightarrow t)))}$	$Ty(e\rightarrow(e\rightarrow(e\rightarrow(e_S\rightarrow t))))$	Three-place predicate
$\boldsymbol{Ty(cn)}$	$Ty(cn)$	Nominal
$\boldsymbol{Ty(cn\rightarrow e)}$	$Ty(cn\rightarrow e)$	Quantifier

(172) Modified tree structure to include an event node



For Hindi, I take that the event node of type $Ty(e_S)$ and the event predicate node of type $Ty(e_S\rightarrow t)$ are fixed by tense and aspect morphology. However, the ergative marker will also be given a role in this respect (see Chapter 5). The event node holds information about tense and aspect; the representation of tense and aspect, however, will be simplified here with the use of a metavariable, such as S_{FUT} where the subscript indicates future tense. Also, just as other argument nodes, the type e_S node is construed as an epsilon term (see Cann, 2011). However,

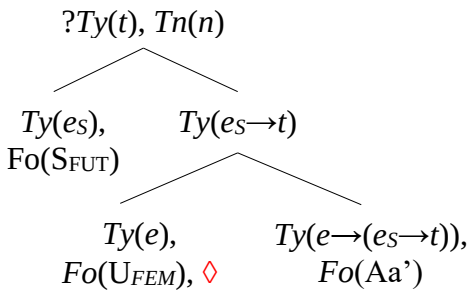
the situation argument's complex internal structure will be omitted in representations in this thesis to keep tree structures simple.

Cann et al. (2005) take English verbs to be parsed in the context of a requirement for a predicate type, i.e. ?*Ty*(*e*→*t*) (if an event node is included in the tree representation, this would be formulated as ?*Ty*(*e*→(*e*$_S$→*t*)) to allow an additional slot for the situation argument). This condition is revised in Cann (2011) with a much more complex lexical entry and an initial ?*Ty*(*t*) trigger for the parse of English verbs. Given the very flexible word order of Hindi, there is good ground to assume that verbs project structure from a type-*t*-requiring node. The parse of the verb and tense information is the point at which event structure and the propositional template unfold. Parsing an intransitive verb leads to the introduction of a 'subject' argument node and a predicate node, while a transitive verb projects an additional 'internal' argument node for the parse of the object. A simplified lexical entry for the intransitive verb *aaegii* in the future is given in (173) (ignoring person specifications). The effect of parsing *aaegii* is illustrated in (174). Requirements to establish a formula value, i.e. ?∃*x*.*Fo*(*x*), are omitted so the lexical entry is as short as possible and the tree structure is not cluttered.

(173) Lexical entry for *aaegii* (simplified)

aaegii	IF	?*Ty*(*t*), *Tn*(*n*)	(i)
	THEN	make(⟨↓$_0$⟩), go(⟨↓$_0$⟩),	(ii)
		put(*Ty*(*e*$_S$)), *Fo*(S$_{FUT}$)),	(iii)
		go(⟨↑$_0$⟩), make(⟨↓$_1$⟩),	(iv)
		go(⟨↓$_1$⟩); put(*Ty*(*e*$_S$→*t*)),	(v)
		make(⟨↓$_1$⟩), go(⟨↓$_1$⟩),	(vi)
		put(*Ty*(*e*→(*e*$_S$→*t*)), *Fo*(Aa')),	(vii)
		go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩),	(viii)
		put(*Ty*(*e*), *Fo*(U$_{FEM}$))	(ix)
	ELSE	Abort	(x)

(174) Parsing *aaegii*



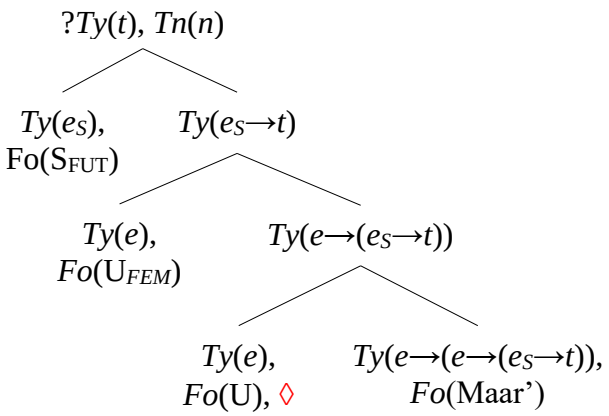
Line (i) of the lexical entry states that if the pointer is at a node decorated with ?*Ty*(*t*), then build an argument node and go down that argument relation (line (ii)). If the pointer is not at such a node, the parse is aborted, as indicated in line (x) of the lexical entry. Assuming that the initial condition is satisfied, the parse proceeds successfully and after building the argument node, the pointer decorates it with type and formula specifications: *Ty*(e_S), S_{FUT} (line (iii)). Then, it is instructed to go up the argument relation, build a functor node (line (iv)), go down that functor relation and decorate it with a type value $e_S \rightarrow t$ (line v). Lines (vi)-(vii) of the lexical entry then build a functor relation and decorate it with the type and formula value of the intransitive verb *aa-* 'come'. The pointer returns to the $e_S \rightarrow t$ node from where it builds an argument node, goes there (line (viii)) and decorates it with type *e* specification and a restricted metavariable (line (ix)). The restriction on the metavariable is projected by agreement morphology on the future verb.

The lexical entry for the transitive future verb *maaregii* is given in (175). The effect of parsing *maaregii* is shown in (176). Again, requirements to establish a formula value, i.e. ?$\exists x.Fo(x)$, are omitted.

(175) Lexical entry for *maaregii* (simplified)

maaregii	IF	?*Ty*(*t*), *Tn*(*n*)	(i)
	THEN	make(⟨↓$_0$⟩), go(⟨↓$_0$⟩),	(ii)
		put(*Ty*(e_S)), *Fo*(S_{FUT})),	(iii)
		go(⟨↑$_0$⟩), make(⟨↓$_1$⟩),	(iv)
		go(⟨↓$_1$⟩), put(*Ty*(e_S→*t*)),	(v)
		make(⟨↓$_0$⟩), go(⟨↓$_0$⟩),	(vi)
		put(*Ty*(*e*), *Fo*(U_{FEM})) ,	(vii)
		go(⟨↑$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩),	(viii)
		make(⟨↓$_1$⟩), go(⟨↓$_1$⟩),	(ix)
		put(*Ty*(*e*→(*e*→(e_S→*t*))), *Fo*(Maar')),	(x)
		go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩),	(xi)
		put(*Ty*(*e*), *Fo*(U))	(xii)
	ELSE	Abort	(xiii)

(176) Parsing *maaregii*



The future verb *maaregii* projects a fixed event node of type e_S and event predicate node of type $e_S \rightarrow t$, which it decorates with appropriate *Fo* values (see lines (ii)-(v) of the lexical entry in (176)). Next, from the event predicate node, an argument node of type *e* is built decorated with a restricted metavariable (lines (vi)-(vii)); this is the 'subject' or the 'external' argument node. The pointer then returns to the event predicate node from where it projects a functor node of type $e \rightarrow (e_S \rightarrow t)$. The pointer goes to the $e \rightarrow (e_S \rightarrow t)$ node from where it projects

a further functor node of type $e \rightarrow (e \rightarrow (e_S \rightarrow t)$ which it decorates with a *Fo* value *Maar'*. The pointer returns to the $e \rightarrow (e_S \rightarrow t)$ from where it builds an argument node of type *e* decorated with a metavariable. This is the 'object' or the 'internal' argument node.

As defined so far, the difference between an intransitive and a transitive verb is in the number of argument nodes projected. Note that this is the minimum number of arguments that the verb subcategorizes for.[16] To reflect the heavily pro-drop nature of Hindi, I assume that the finite verb projects type-complete argument nodes decorated with metavariables (following work on Japanese and Korean; see Kempson & Kiaer, 2009a; Kiaer, 2007). There is, however, an outstanding question as to whether this is the right analysis to pursue. At present, I am not aware of a detailed study on Hindi object drop and/or ellipsis (especially in dialogic data) which would inform an analysis. What is proposed so far, with the structure in (176), might offer too much flexibility: given that the type-complete 'object' node is decorated with a metavariable, in practice nothing restricts what value is retrieved from the context. It might turn out to be the case that object drop is to be treated as re-use of structure (see Section 3.5) rather than SUBSTITUTION of a metavariable with a term. I leave this to one side for future work; the analysis developed allows straightforward rework should an empirical investigation prove otherwise.

So far only the future tense has been discussed. In other tense and aspects the burden of structure building is shared between the main verb and auxiliaries or light verbs.[17] To take the progressive, the example in (177) shows the main verb *khaa* 'eat' in root form, followed by the progressive auxiliary *rah-* 'stay' and the past form of *ho-* 'be'. Both auxiliaries carry subject agreement morphology, namely the suffix *-ii*.

[16] I am not concerned here with the parse of adjuncts.
[17] The term 'light verb' is used by Butt (2010) to refer to VV combinations in Hindi/Urdu in which the first verb contributes its lexical meaning and the second carries tense and aspect marking.

(177) miiraa seb k^{h}aa rah-ii t^{h}-ii
Mira.F apple.M eat PROG-F be.PST-F
'Mira was eating an apple.'

I assume that the transitive verb root projects an internal argument, the 'object' node (see Chapter 5) but fixing the subject node is dependent on the parse of temporal and aspectual information. For (177), it is the auxiliaries that project a fixed argument node for the subject expression. The verb root itself is parsed onto an unfixed predicate node built via PREDICATE *ADJUNCTION (see Section 3.4.2.6). This will allow accounting for (pragmatically marked) constructions in which the lexical verb is in root form and is realised away from aspect and/or tense carrying auxiliaries for contrastive purposes, as in (178) (verbal stems are in **bold**). The details of the analysis are presented in Chapter 5.

(178) **bol** tum rah-ii t^{h}-ii **sun** maiN rah-aa t^{h}-aa
speak 2SG PROG-F be.PST-F listen 1SG PROG-M be.PST-M
'You were speaking, I was listening.'

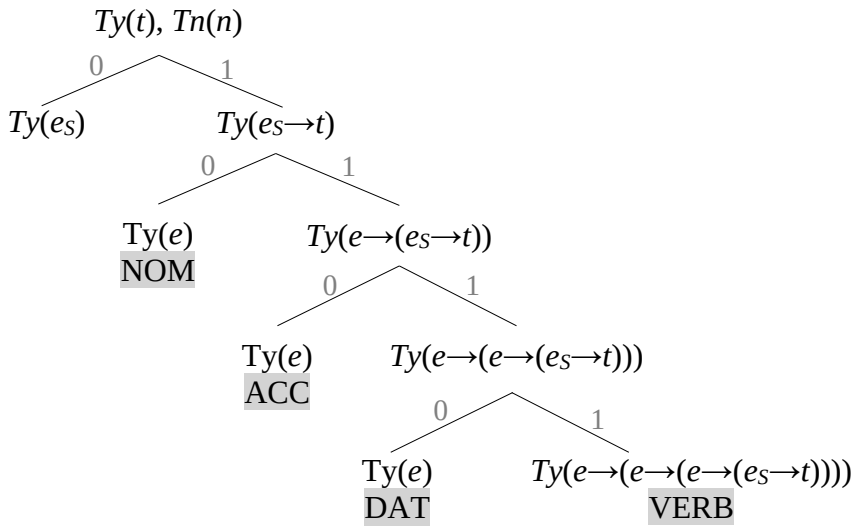
3.4.3.4 The role of case markers

In DS, case marking has a constructive role (as in Nordlinger, 1998); it gives instructions as to the possible tree node address of an unfixed node of type *e*. They are treated as 'output filters' imposing requirements on possible tree growth forms (Cann et al., 2005; Kempson et al., 2013; Kiaer, 2007).

With the addition of the situation argument node, the requirements imposed by case marking can be formulated in the following way: nominative case marking introduces the requirement $?\langle\uparrow_0\rangle Ty(e_S\rightarrow t)$ which instructs that the node is to find such an address that it is immediately dominated along an argument relation by a node of type $e_S\rightarrow t$, accusative introduces the requirement $?\langle\uparrow_0\rangle Ty(e\rightarrow(e_S\rightarrow t))$ which states that the node is to be immediately dominated along an argument relation by a node of type $e\rightarrow(e_S\rightarrow t)$ and dative imposes the

requirement ?⟨↑$_0$⟩*Ty*(*e*→(*e*→(*e*$_S$→*t*))) which dictates that the node is the argument daughter of a node of type *e*→(*e*→(*e*$_S$→*t*)). For illustration, a propositional template projected by a ditransitive verb is given in (179) which shows the tree node position associated with nominative, accusative and dative case marking.

(179) Case marking and tree node address



Nominative case marking involves one step down a functor ('1') relation and one step down an argument ('0') relation from the top type *t* node, whereas accusative involves two steps down a functor relation and dative involves three steps down a functor relation from the type *t* node before one step down an argument relation is made. When building locally, i.e. with respect to the most immediate type *t* node from which a locally unfixed node is built (via LOCAL *ADJUNCTION), case marking directly updates the tree node address and fixes the position of the node. In the case of long-distance scrambling, i.e. when parsing an NP scrambled out of an embedded clause (via *ADJUNCTION which imposes no locality restriction), case marking acts merely as a filter on output (Kempson et al., 2013), i.e. it specifies the type of tree node address

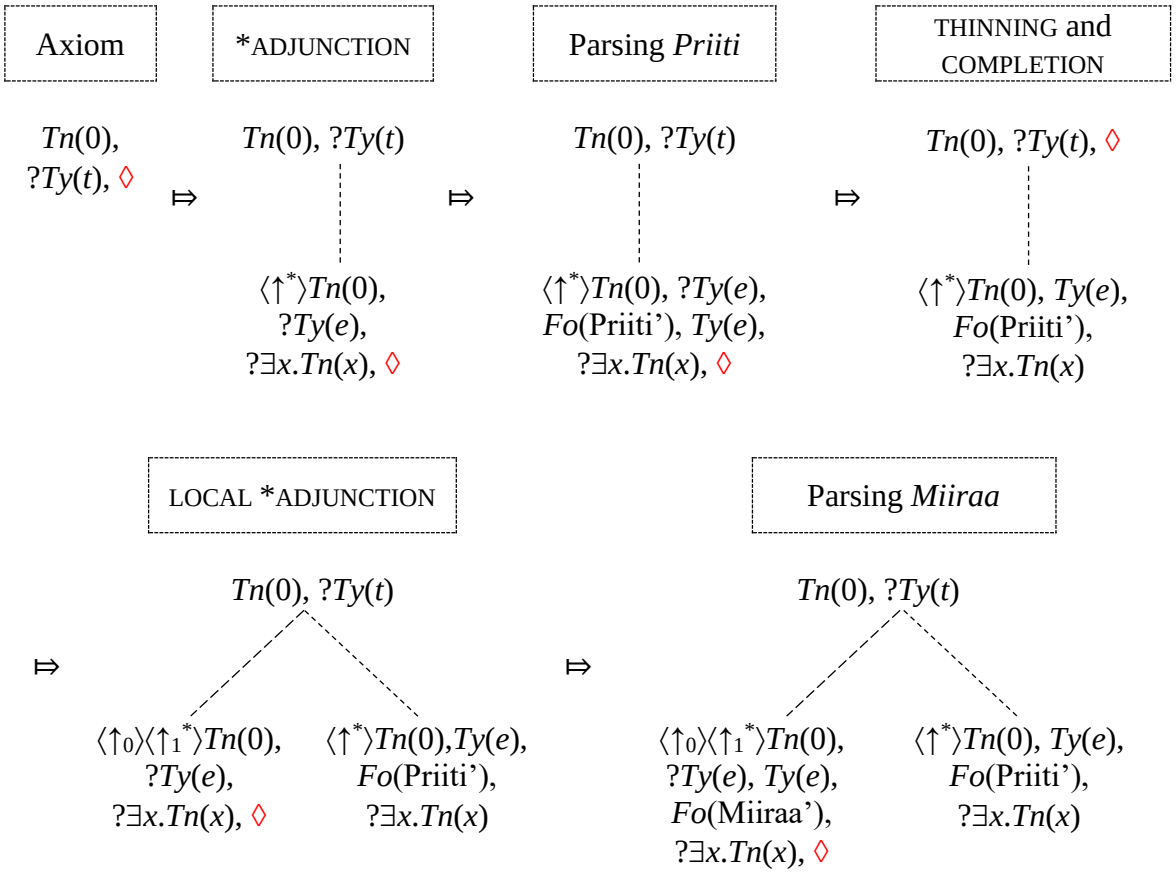
the unfixed node is to find in relation to other nodes in the tree once more information has become available.

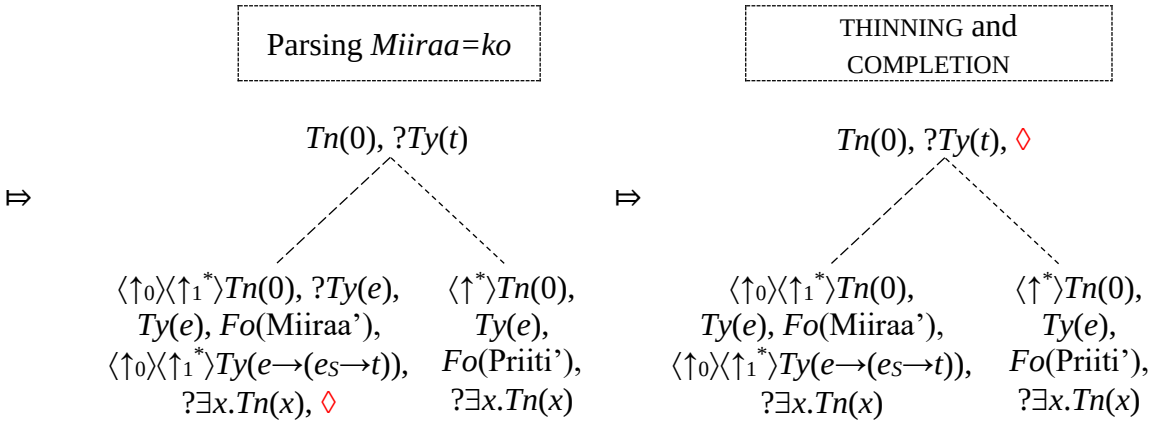
This approach to case has been applied in DS analyses of Latin (Kempson et al., 2013), Greek (Chatzikyriakidis, 2010), Korean (Kiaer, 2011), Japanese (Kempson & Kiaer, 2009a). Hindi poses a challenge as there is no clear correspondence between syntactic function and case marker, nor a clear direct mapping between thematic role and case marker. As subsequent chapters will discuss in detail, case marking in Hindi relates to aspect but also properties of nouns themselves as well showing differential treatment of the object to do with animacy and specificity. Hindi generally follows a nominative-accusative pattern when it comes to human/animate nouns in non-perfective contexts. In the perfective, Hindi follows an ergative alignment pattern retaining the restriction for objects high in animacy such as proper names to be marked. In addition, it shows homophonous accusative and dative case.

In this thesis I follow previous work within DS in which case marking has a constructive role but in addition to projecting information about argument structure in advance of parsing the verb, case also contributes information about event structure before parsing the verb. Unmarked NPs (often analysed as nominative in other approaches) are associated with structural uncertainty, i.e. they find a tree node address as the parse progresses, whereas the ergative marker unambiguously points to the agent of a single-occurrence event. In DS terms this is the immediate argument daughter of a node of type $e_S \rightarrow t$. The accusative/dative is treated as an indicator of a non-agent argument. This allows capturing its dual function; it imposes the restriction that the node is to be dominated by a node of type $e \rightarrow (e_S \rightarrow t)$ along one argument relation and an unspecified number of functor relations (zero or more), expressed formally as $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Ty(e \rightarrow (e_S \rightarrow t))$. In other words, *=ko* does not directly fix the tree node address of the node but it imposes a restriction that this is not the agent and thus it can only find a position

within the tree as a daughter of a node of type $e \rightarrow (e_S \rightarrow t)$ no matter how deeply embedded. (180) shows the series of steps starting from the axiom for the parse of a sequence of two proper names where the second is *=ko* marked.

(180) Parsing *Priiti* *Miiraa=ko*
Priti.F Miiraa.F=ACC





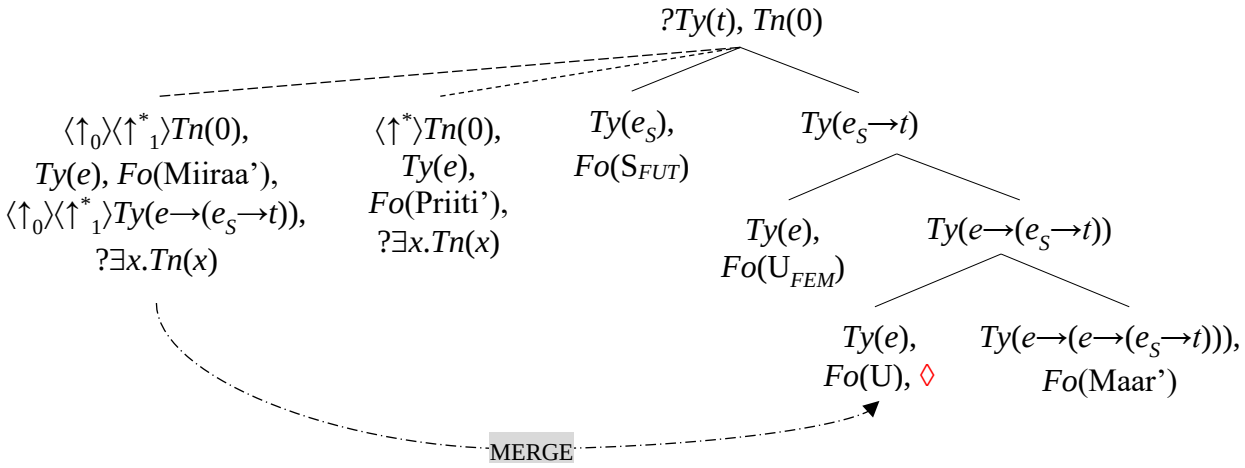
Starting from the axiom, the parse starts with the building of an unfixed node via the rule of *ADJUNCTION (see Chapter 5 for a more detailed discussion on the availability of different computational rules at the start of a parse). This allows the parse of *Priiti* whose lexical actions decorate the unfixed node with type *e* and formula specifications (the internal structure of the type *e* node is omitted in the representation). THINNING applies to delete the satisfied requirement and COMPLETION moves the pointer back to the root node. At this point, LOCAL *ADJUNCTION builds a locally unfixed node with a requirement for type *e*. Note that at this point only a locally unfixed node can be built as a more general unfixed node is already present in the tree structure. The DS model does not allow more than one unfixed node of a type to be co-present within a single tree structure as identical tree node specifications will lead to the collapse of the two unfixed nodes into one. Why the parse is started with the more general rule (*ADJUNCTION) followed by the local version of the rule (LOCAL *ADJUNCTION) is motivated with data from Hindi long-distance scrambling in Chapter 5.

Having built a locally unfixed node, the pointer is at the right place for the parse of the second proper name *Miiraa*. The lexical actions projected by *Miiraa* decorate the node with *Ty* and *Fo* values. Next, the pointer still being at the type e node, the case marker *=ko* is parsed introducing the requirement $\langle\uparrow_0\rangle\langle\uparrow_1^*\rangle Ty(e\rightarrow(e_S\rightarrow t))$. The rules of THINNING and COMPLETION

apply again and the pointer is moved to the topnode. The details of the analysis of *=ko*, as well as its lexical entry follows in Chapter 5.

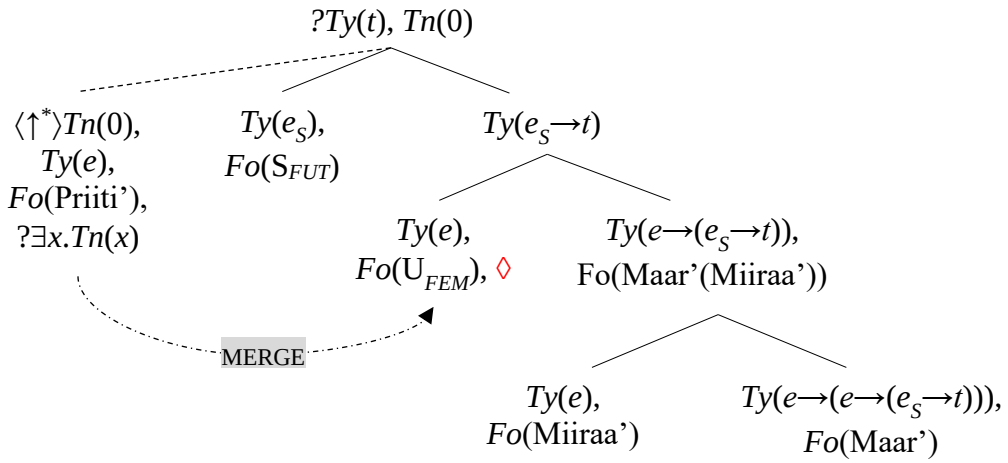
The next step is to parse the tensed verb, which projects the whole propositional template, leaving the pointer at the 'object' node, as shown in (181). The locally unfixed node unifies with the 'object' node, providing a formula value for the metavariable and satisfying the $\langle\uparrow_0\rangle\langle\uparrow^*_1\rangle Ty(e\rightarrow(e_S\rightarrow t))$ condition that the node carrying the concept Miiraa' finds such a tree node address that it is dominated by a node of type $e\rightarrow(e_S\rightarrow t)$ along one argument relation and an unspecified number of functor relations (in this case – zero).

(181) Parsing *Priiti* *Miiraa=ko* *maar-egii*
Priti.F Mira.F=ACC hit-FUT.F.3SG
'Priti will hit Mira.'



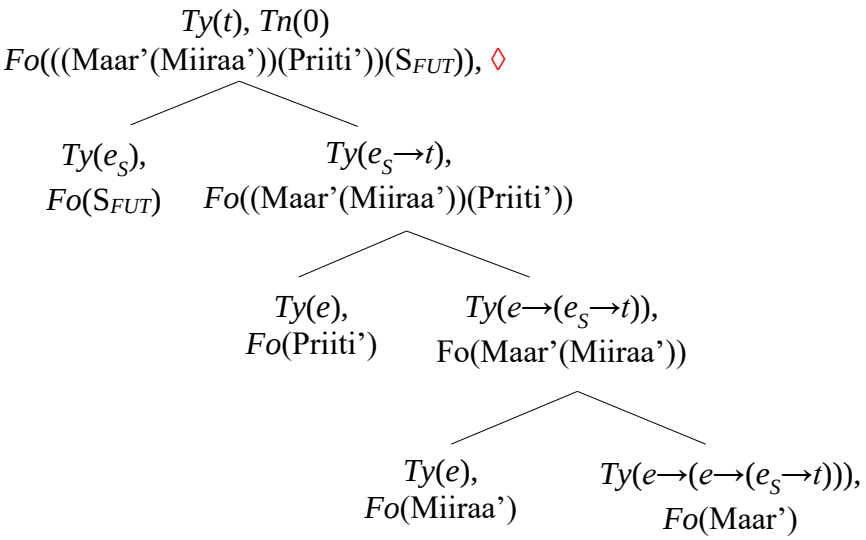
Next, the pointer moves one step up after THINNING and COMPLETION. ELIMINATION derives a completed formula value for the $e\rightarrow(e_S\rightarrow t)$ node: *Fo*(Maar'(Miiraa')). The pointer moves up to the $e_S\rightarrow t$ node via COMPLETION and then moves to the 'subject' node via ANTICIPATION. The unfixed node unifies with the 'subject' node, as shown in (182).

(182) Finishing stages: MERGE with 'subject' node



After the unification, the metavariable at the 'subject' node finds a *Fo* value, and the requirements associated with the unfixed node are satisfied. Again, THINNING applies which deletes all satisfied requirement, the pointer moves up an argument relation via COMPLETION and derives the *Fo* value (Maar'(Miiraa'))(Priiti) at the $e_S \rightarrow t$ node. As before, the pointer moves to the top node via COMPLETION. Then, ELIMINATION yields complete *Fo* and *Ty* values at the topnode. With a final step of THINNING, the fully complete propositional structure in (183) is derived.

(183) Final completed propositional structure



A more detailed exploration on case marking patterns in Hindi and a more detailed DS account is explored in subsequent chapters, the aim here being simply to introduce the type of analysis pursued and the DS approach to case more generally. The ergative marker *=ne* and the accusative/dative *=ko* are discussed in detail in Chapter 5 where it is argued that each contributes structural information, but also indicates that everything that is needed for the parse of a NP is already available. This captures specificity effects associated with the use of the case markers and the impossibility to postpose modifying structure to the right of a case-marked head. NP-modification is rigidly ordered before the case-marked head nominal; the empirical facts thus support an analysis of the *=ne* and *=ko* markers as performing a term-closure function (see Chapters 4-5).

In sum, case markers have an important role in the incremental build-up of semantic structure before the contribution of the verb. Their role, on the one hand, is to project information about predicate-argument structure expressing the relation the parsed nominal has with respect to other nodes in the incrementally construed event predication, and on the other they act as an indicator of a type *e* complete node, triggering the closure of a term to be

interpreted with respect to whatever information has been made available up to the point of parsing the case marker.

3.4.3.5 Summary

This section has discussed the role of lexical actions in the incremental process of meaning construction and has presented basic assumptions about modelling the contribution of case and subject agreement in Hindi with the purpose of introducing the tools of DS. Lexical entries can be modelled in such a way that words and morphemes impose requirements with respect to the immediate linguistic context in which parsed, i.e. the partial tree under development. Also, the section has shown that lexical items can yield structure in addition to introducing concepts which decorate tree nodes. This was the case with Hindi finite verbs and tense-aspect carrying auxiliaries. In fact, auxiliaries do not contribute lexical meaning (i.e. a *Fo* value); they aid the build-up of fixed structure at the finishing stages of the derivation and contribute information about the temporal and aspectual organisation of the event. Similarly, case markers' role is constructive; they induce (partial) structural update of an unfixed node and indicate an NP boundary.

3.5 Structure-building in context

The DS concept of context is truly dynamic; the context constantly evolves with the parse of each word. It keeps a record of established propositional structures but also the sequence of partial structures and actions taken to derive them (Kempson et al., 2015; Kempson et al., 2016). All completed propositional structures, as well as all transitional steps (snapshots of partial structures) and the procedures used to derive them are stored in the context. What this

means is that the tree construction process itself can be understood as incremental (word-by-word) context-growth. Each transitional step of the construction process constitutes a context update, relative to which the next update is made as dictated by computational and lexical actions. Such an approach allows for various types of information to be retrieved from the context. So far we have only discussed the retrieval of semantic formulae from the context via SUBSTITUTION but the DS concept of context also allows re-use of sequences of actions and re-use of structure; for this, see DS work on ellipsis (Kempson et al., 2015; Kempson, Gregoromichelaki, & Eshghi, 2019).

The expression of focus involves an update to a presupposed proposition, i.e. focal material provides an informational update relative to context. This is most obvious in question-answer pairs, as in (184), where the question in (a) acts as a context for the parse of the fragment answer in (b):

(184) (a) kaun aa -yaa
who come-PFV.M.SG
'Who came?'

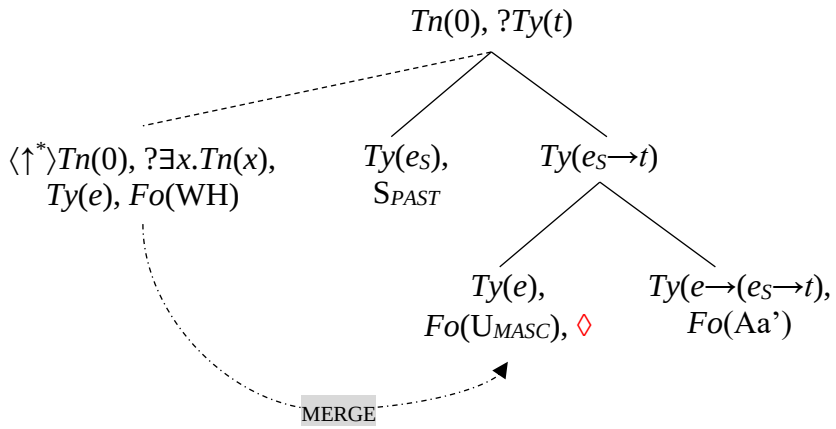
(b) pranav (aa-yaa)
Pranav.M come-PFV.M.SG
'Pranav (came).'

The parse of the question in (a) proceeds as follows: the question word *kaun* 'who' is parsed onto an unfixed node which it decorates with a specialised metavariable WH, as well as a requirement that the node finds an address as the daughter of an event predicate node (i.e. $?\langle\uparrow_0\rangle e_S \rightarrow t$)[18]. Next, the perfective verb projects a fixed predicate-argument structure. After THINNING, COMPLETION and ANTICIPATION apply, the unfixed node carrying the WH

[18] Further specifications can be added, such as a requirement for a human or animate expression. However, I omit unnecessary decorations so the trees are more readable.

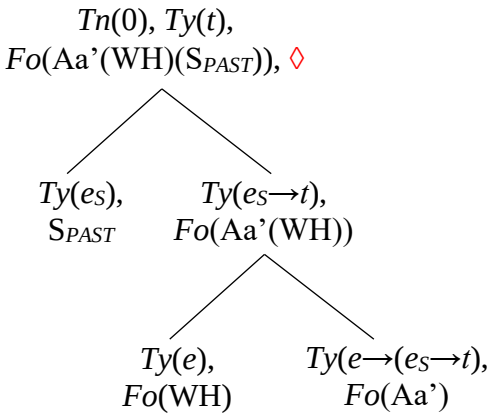
metavariable can merge with the fixed type *e* node which is still to find a *Fo* value. This is illustrated in (185):

(185) Parsing *kaun aayaa*



Upon the parse of the tense auxiliary, the parse is completed, as shown in (186). The WH metavariable awaits substitution from a future utterance. The derived propositional tree now acts as the context against which a reply is given.

(186) Completing parse of question

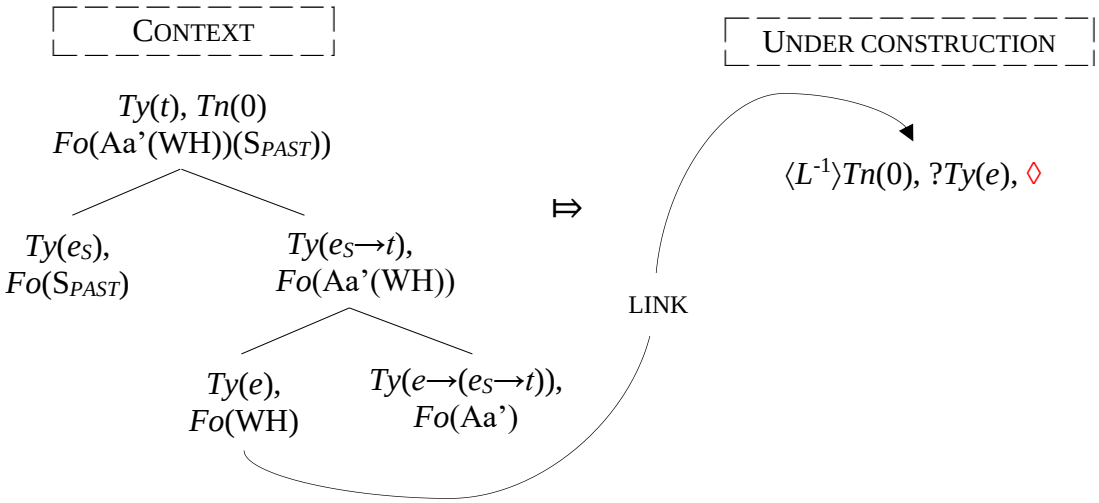


Having generated the structure in (186), the parser can now take the role of a generator. The question yields an open proposition which acts as a departure for the hearer's answer (for a DS

account of English question-answer pairs, see Kempson et al. (2011)). This is in keeping with Krifka's (2007, 2008) argument that questions are essentially strategies for common ground management.

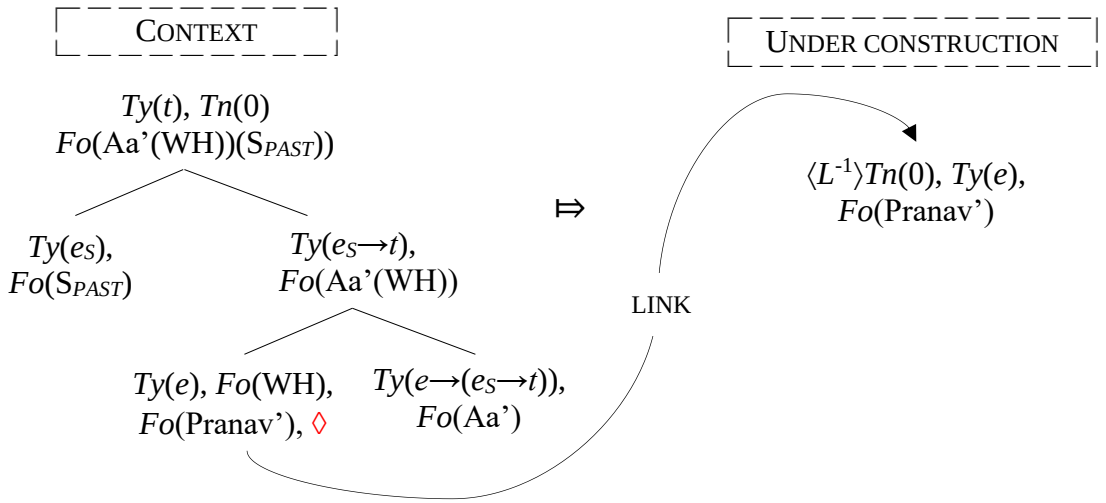
I hypothesise that the presence of such a metavariable in the structure licences the move of the pointer to its node in anticipation for informational update. Then, the hearer departs from the structure projected by the question, illustrated in (187), with the building of a LINKed structure of type *e* from the node carrying the **WH** metavariable.

(187) Parsing *Pranav*: building a LINKed structure



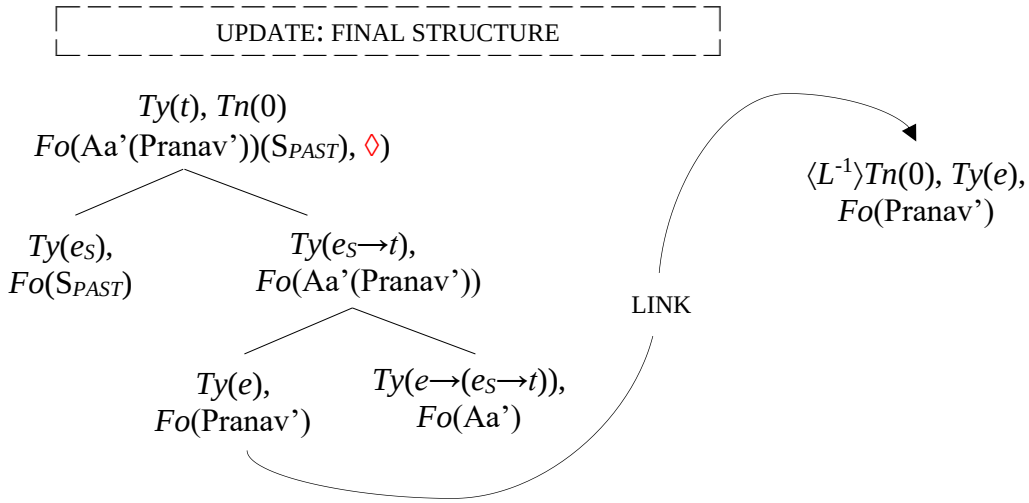
Then, the lexical entry for *Pranav* instructs the pointer to decorate the node with type and formula values. This allows the return of the pointer to the 'main' tree. The two formula decorations (WH and Pranav') are evaluated as the same term, i.e. they refer to the same entity, as in (188):

(188) Parsing *Pranav*: decorating LINKed structure and return to 'main' tree



In this way the fragmented answer provides information for the update of the open (background) proposition, as in (189):

(189) Parsing *Pranav*: updating background proposition



This section showed that the DS formalism allows accounting for the context-dependence of information-structural phenomena and provides a way for capturing the interactive nature of communication between participants as building representations of meaning in tandem. This is reminiscent of theories of information structure built around the

notion of an evolving common ground in the course of communication (Krifka, 2008). DS proposes a formalised notion of context which 'grows' with the processing (both parsing and production) of each word. Hearer and speaker are able to depart from some structure (complete or partial) relative to their communicative goals.

3.6 Summary and conclusion

This chapter has presented a brief introduction to the Dynamic Syntax framework. It has discussed the assumptions and conceptual claims it is based on and has introduced its formal tools. Under the DS approach, natural language syntax is understood as the incremental 'growth' of semantic information, formally expressed in terms of gradually unfolding semantically transparent binary trees until a propositional formula is derived. Importantly, there is a single level of representation and different aspects of a language's grammatical structure contribute in tandem for the 'growth' of semantic representations.

As we saw, transitions between partial trees are driven by a combination of language-specific lexical instructions, universally available computational rules, as well as pragmatic enrichment. While constraints on the construction process such as the restriction for a single unfixed node of a type are universally available, the lexicon is the domain for accounting for language-specific idiosyncrasies. Prosodic information can be argued as well to have a constructive role in aiding structural choices in online parsing (Kiaer, 2007) but the study of Hindi prosody falls outside of the scope of this thesis.

This chapter has presented the basic assumptions made with respect to the parse of a Hindi strong of words. It introduced (some of) the challenges that Hindi poses for incremental modelling which are further explored in subsequent chapters of this thesis. It argued that

unmarked nominals are associated with structural uncertainty, whereas case markers specify the role of an expression within the unfolding propositional structure. Tense-aspect information indicates reaching a propositional boundary and provides the information needed for 'finishing off' the derivation and triggers the compilation of information at the type *t* node to yield a truth-conditional formula.

The final established propositional tree structure is just as important as the transitional stages and the sequence of actions involved to derive them; in fact, the context 'grows' with the parse of each word. It keeps a record of established propositional tree structures, as well as the series of partial trees and the actions that led to deriving them. This allows formulating incremental context 'growth' in terms of a sequence of updates of partial trees.

The nature of the DS formalism allows pursuing an analysis of focus as 'update' effects in the incremental process of semantic structure building in relation to the context. Word order variation and associated pragmatic effects have to do with the *way* a propositional structure is derived. Different word orders would yield the same final propositional tree while following different parsing routes to derive it. These claims are later revisited in Chapter 6 which addresses the expression of focus in Hindi in more detail. Before that, a more detailed exploration of Hindi clause structure from the perspective of DS is given in Chapters 4 and 5.

4 Nominal interpretation in context

4.1 Introduction

Having introduced the formal tools of Dynamic Syntax in Chapter 3, the present chapter takes a closer look at nominal interpretation and makes first steps towards representing the content of Hindi NPs in Dynamic Syntax. The complexity of how to represent NP construal stems from the fact that Hindi lacks a specialised indefinite or definite article and bare nominals allow a range of different readings that relate to information structural functions, the syntactic positions in which realised, as well as case marking but also factors such as aspect (Dayal, 1992, 1999, 2004, 2008, 2017a, 2018).

This chapter explores strategies for introducing new discourse referents in Hindi and picking them up in subsequent discourse. New discourse referents tend to be introduced with the use of the numeral *ek* 'one' and can be subsequently picked up by a bare noun, a combination of a demonstrative and a noun or a pronoun. The chapter also discusses the relationship between word order, nominal interpretation and the expression of focus. Typically, the clause-initial position houses topical material and favours definite specific readings of bare

nominals. However, in 'marked' contexts (such as, for example, corrections) a prosodically stressed bare nominal in initial position allows a non-specific reading (see Dayal, 2008). In such cases, it presents material in focus that provides an informational update in relation to a presupposed proposition.

The main argument put forth in this chapter is that definiteness and specificity are to be understood as context-related interpretive effects where context is understood to include the wider discourse context but also the immediate linguistic context, i.e. the string of words amongst which the nominal is realised. This means treating nominals as underspecified for their precise interpretation and concentrating on *how* an interpretive effect is achieved relative to the context. In keeping with the general argument developed in this thesis, this implies an analysis formulated in procedural terms. The different readings available to nominals in the initial position are shown to follow directly from the availability of different parsing mechanisms at the onset of a parse in interaction with information from the context.

In what follows, Section 4.2 outlines the empirical background. It introduces the general patterns observed in Hindi with data from previous work but also naturalistic data collected during two trips to Delhi via production tasks, as well as translation-based elicitation and data from the EMILLE Hindi corpus (see Section 1.4 on data collection). Section 4.3 discusses the role of *=ko* as a differential object marker and associated specificity effects. Section 4.4 gives an overview of previous theoretical approaches to nominal interpretation and highlights points of divergence with the approach developed in this thesis. Section 4.5 takes first steps towards a DS analysis of Hindi nominal interpretation with the necessary warning that much more work remains to be done. Finally, Section 4.6 draws a summary and conclusion.

4.2 Unmarked common nouns: empirical observations

4.2.1 Preliminaries: the notions of (in)definiteness and specificity

I follow von Heusinger (2004) who refers to the notion of *contextual salience* to explain the role of indefinite and definite NPs in discourse. An NP, whether definite or indefinite, updates the context in such a way that it points to the (current) most contextually salient individual that satisfies the description. For example, an indefinite NP such as *a golden retriever* in (190)[19] changes the context by introducing a new salient individual. In fact, as the addressee is expected to know that a golden retriever is a breed of dog, it introduces a salient dog in the discourse.

(190) Mary has a golden retriever. She adores the dog. Apparently, he eats a lot.

The subsequent definite NP *the dog* refers to the most contextually salient individual with a property of being a dog that is provided by the context. This is identified to be the newly introduced referent of Mary's golden retriever. Definite NPs also affect the salience structure by making their referent the most salient individual that satisfies the description. Then, the definite pronoun *he* refers to the most salient (male) individual in the discourse. In the 'mini' discourse in (190) the only available salient individual that can satisfy the description is Mary's dog. Therefore, definite NPs are interpreted with respect to what is provided by the context, and more concretely with respect to contextual salience structure but also share with indefinite NPs context update potential. See von Heusinger (2004: 310-311) for a detailed argumentation and examples on why such a 'dynamic' perspective is needed for an analysis of definite NPs as opposed to uniqueness-based accounts of definite expressions.

[19] The example is constructed by me for illustrative purposes, following the argumentation in von Heusinger (2011).

A further relevant notion when discussing nominal interpretation is specificity which is often used to distinguish between specific and non-specific indefinites (see von Heusinger, 2019 for a very comprehensive overview of theories of specificity). Though, von Heusinger (2002) argues that specificity is a category in its own right that cuts across the definite vs. indefinite distinction (like genericity). I follow an informal definition of specificity as speaker's intention to present some NP as referring to a particular referent; this is also known as "referential intention" (von Heusinger, 2011: 1026). This can be some referent that is presented as retrievable from the common ground leading to discourse-anaphoric readings (the so-called *definite specific* readings) or a referent that is construed as discourse-new for the hearer (usually described as *specific indefinite* readings).

Non-specificity will be discussed with reference to object interpretation. Non-specific objects do not pick up a particular individual from the discourse context, i.e. they join the predication as unindividuated objects. In the literature on Hindi, and closely related Urdu, this is often referred to as the phenomenon of noun incorporation or 'pseudo' noun incorporation (Butt & Ahmed, 2007; Dayal, 2011, 2015).

4.2.2 Subjects

New discourse referents in Hindi tend to be introduced with the help of the numeral *ek* 'one'. This is shown in (191)(a) with the use of *ek billii* 'one/a cat' and *ek kutta* 'one/a dog'.

(191) Introducing and picking up referents:

(a) mere paas ek billii aur ek kuttaa hai
1SG.POSS near one cat.F and one dog.M be.PRS.3SG
'I have a cat and a dog.'

(b) billii mach^{h}lii k^{h}aa-t-ii hai aur kuttaa murgii k^{h}aa-t-aa hai
cat.F fish.F eat-IMPF-F be.PRS.3SG and dog.M chicken.F eat-IMPF-M.SG be.PRS.3SG
'The cat eats fish and the dog eats chicken.' (elicited)

In subsequent discourse these referents are picked up with the bare unmarked subject NPs *billii* 'cat' and *kutta* 'dog'. The bare subject nouns in (191)(b) act as discourse-anaphoric expressions which pick up an appropriate unique referent that satisfies the descriptive content of the NP (the property of being a cat or a dog). In contrast, the bare objects *mach^{h}lii* 'fish' and *murgii* 'chicken' are used non-specifically. From an information-structural perspective, *billii* 'cat' and *kuttaa* 'dog' in (191)(b) are definite topical subjects. The focus is on what is predicated of the subject, i.e. on the whole of the predicate.

The example in (192)(a) asks a question about cats in general uttered in a context with no salient individual with the property of being a cat. In the answer in (192)(b) *billii* 'cat' does not receive an individuated reading; instead the utterance reads as a general statement with no reference to a specific cat being made. Similarly, in (193) in the absence of a contextually salient referent *gaay* 'cow' leads to a generic reading.

(192) Question-answer pair: generics

(a) billii kya k^{h}aa-t-ii hai
cat.F what eat-IMPF-F be.PRS.3SG
'What does the cat eat?'/'What do cats eat?'

(b) billii mach^{h}lii k^{h}aa-t-ii hai
cat.F fish.F eat-IMPF-F be.PRS.3SG
'The cat eats fish.'/'Cats eat fish.' (elicited)

(193) Generic reading:

gay duud^{h} de-t-ii hai
cow.F milk.M give-IMPF-F be.PRS.3SG
'The cow gives milk (i.e., cows give milk.)' (Kachru, 2006: 55; adapted transription and glosses)

In both (192) and (193) we observe imperfective morphology which leads to a habitual reading[20] and relates to the generic readings of the utterances. In this case, in the absence of a contextually salient individual, the bare nominals make reference to the kind (as per world knowledge – the cat and cow species, respectively). This could also be understood as reference to a *prototypical* individual of the kind (Radden, 2009) as opposed to a particular instantiation of the kind, making the difference between the two readings. The role of the imperfective in such constructions is that it allows an interpretation in which the agent is not some particular individual.

In short, the same string of words can give rise to a definite reading (i.e. referring to a particular individual) of the subject *billii* 'cat' in (191)(b) and a generic reading (i.e. referring to a prototypical individual) in (192)(b). The different readings are functions of the different contexts in which these occur. A bare subject is interpreted against information shared by the interlocutors and picks up a referent, if one is available in the common ground. Otherwise, in the absence of a specific agent, the nominal is interpreted as generic against imperfective morphology as referring to some prototypical individual (as per world knowledge). When it comes to information structure, both utterances follow the same pattern. The initial bare subject (whether definite or generic) is the topical element 'about' which the rest of the utterance (i.e. the whole predicate) provides information.

Observations that new discourse referents are introduced with the help of the numeral *ek* 'one' and are subsequently picked up by a bare noun or a pronoun are confirmed with naturalistic data from production tasks such as story narration. (194) is an excerpt from a task involving two participants (A and B) who are given the same picture story but each has a

[20] See Butt & Rizvi, 2010 for a discussion on tense and aspect morphology in Hindi-Urdu.

different final scene. Picture materials and design of the task come from the *Questionnaire on Information Structure* (QUIS)[21] (Skopeteas et al., 2006: 126). Participants were instructed to tell the story together while each is looking only at their picture sequences with the purpose of identifying any differences in their stories.[22]

The excerpt in (194) shows how new discourse referents are introduced and strategies for picking them up in subsequent discourse. Common nouns are in **bold** and pronouns are underlined. Line numbers are included for ease of discussion.

(194) Collaborative task: Tell a Story

line 1 A: **ek** **kuttaa** b^{h}aag rah-aa hai jangal=meN aur p^{h}ir na ...
one dog.M run PROG-M.SG be.PRS.3SG forest=in and then TAG
'A dog is running in the forest and then …'

ine 2 B: ek bachchaa …
one child
'A child…'

line 3 A: **ek** **bachchaa** b^{h}aag rah-aa hai
one child run PROG-M.SG be.PRS.3SG
'A child is running.'

line 4 B: vo[23] **kutte**=se Dar-ke b^{h}aag rah-aa hai
3SG dog.M.OBL=from fear-CONJ run PROG-M.SG be.PRS.3SG
'He, being afraid, is running from the dog.

line 5 **kuttaa** us=ke pich^{h}e b^{h}aag rah-aa hai
dog.M 3SG.OBL=GEN.M.OBL behind run PROG-M.SG be.PRS.3SG
'The dog is running behind him.'

[21] Picture materials used for this task can be found on the following link: https://www.sfb632.uni-potsdam.de/materials/FieldManual4.pdf

[22] Story narration tasks were purposefully performed with two participants where possible to exclude the researcher and avoid a situation in which the participant tells the story to the researcher. Instead, participants were encouraged to interact with each other; this allows keeping track of shared information between the interlocutors in keeping with recent literature on information structure as involving common ground content and management (see Chapter 2).

[23] Note that here is the pronoun use of *vo* and not the demonstrative and refers to the child. It is worth exploring prosodic cues for differentiating between the two uses.

line 6 A: haaN **kuttaa** us=ke pich^{h}e b^{h}aag rah-aa hai
yes dog.M 3SG.OBL=GEN.M.OBL behind run PROG-M.SG be.PRS.3SG
'Yes, the dog is running behind him.'

line 7 **kuttaa** bahut kariib b^{h}aag rah-aa hai us=ke
dog.M a.lot close run PROG-M.SG be.PRS.3SG 3SG.OBL=GEN.M.OBL
'The dog is running very close to him.'

line 8 B: vo pich^{h}e muD-muD-ke dek^{h} rahaa hai
3SG behind turn-turn-CONJ look PROG-M.SG be.PRS.3SG
'He is turning and looking behind.'

line 9 A: haaN aur **kutta** bahut hii zyada paas aa gayaa
yes and dog very EMPH a.lot near come go.PFV.M.SG
'Yes, and the dog has come very close.' (production task; 161020-195051)

At the start of the story, lines 1-3 introduce the story's participants, a dog and a child, with the help of the numeral *ek* 'one' preceding the common nouns. The role of *ek* is to signal the introduction of a new discourse referent that can be picked up in subsequent discourse. Line 4 shows reference to the child with the third person singular pronoun *vo*, right after it is first introduced in line 3. In von Heusinger's (2004) terms, the pronoun *vo* is interpreted as referring to the most salient individual. At this point this happens to be the child as its referent was introduced immediately prior to the use of the pronoun. Reference to the dog happens with the use of the bare nominal *kuttaa* 'dog'. This pattern continues in subsequent discourse, as shown in lines 5-9.

In lines 5-7 *kuttaa* 'dog' is the continuing topic realised in initial position. However, the boy's referent is also under discussion. The utterances in lines 5-7 give information about the relation that holds between the referents of the dog and the boy.[24] In line 7 the pronominal

[24] These utterances could also be thought of as constructions with multiple topics. See Lambrecht (1994) who discusses the occurrence of multiple topics, as well as Nikolaeva (2001) who proposes the notion of secondary topic.

form *us=ke* (3SG.OBL=GEN.M.OBL) is realised postverbally and refers to the boy (normally, *us=ke* would surface before *kariib* 'close' for *us=ke kariib* 'close to him/her').[25] This seems to be a case of what Gambhir (1981) describes as 'old' material realised postverbally which he argues is to achieve a de-emphasis effects (see Chapter 2, Section 2.4).

The use of *ek* 'one' for introducing new referents, especially in presentational contexts, is clearly observed in results from other experimental tasks as well. In (195) we see an excerpt from the *Locations Task*[26] (Skopeteas et al., 2006: 73). The numeral *ek* and the demonstrative *vo*/*us*[27] are in **bold**. For this task a single participant is presented with a series of pictures and is asked to describe what they see as if the sequence of pictures represent a sequence of events. Pictures are shown one by one to the participant.

(195) *Locations Task*

(a) Picture 1

ek	kuaa	hai	aur	**us**	kue=ke	saamne
one	well.M	be.PRS.3SG	and	that.OBL	well.M.OBL=GEN.OBL	in.front

ek	aadmii	k^haR-aa	hai
one	man.M	stand-PFV.M.SG	be.PRS.3SG

'There is a well and in front of that well a man is standing.'

[25] Genitive modifiers in Hindi are easily postponed to postverbal position. This was also discussed in Chapter 1, section 1.2.2.

[26] The picture materials used can be found on the following link: https://www.sfb632.uni-potsdam.de/materials/FieldManual3.pdf

[27] *Us* is the oblique variant form of *vo* 'that' (also 'he/she') and surfaces when followed by a case marker/postposition.

(b) Picture 2

vo	aadmii	ab	**ek**	jaalii=kii	divaar=ke	pich^{h}e
that	man.M	now	one	iron.net/mesh=GEN.F	wall.F=GEN.OBL	behind

k^{h}aR-aa	hai
stand-PFV.M.SG	be.PRS.3SG

'Now that man is standing behind a fence.'

(c) Picture 3

ab	**us**	jaalii=kii	divaar=ke	pich^{h}e
now	that.OBL	iron.net/mesh=GEN.F	wall.F=GEN.OBL	behind

ek	aurat	k^{h}aR-ii	hai
one	woman.F	stand-PFV.F	be.PRS.3SG

'Now behind that fence a woman is standing.'

(d) Picture 4

vo	aurat	ab	**us**	jaalii=kii	divaar=ke	aage
that	woman.F	now	that.OBL	iron.net/mesh=GEN.F	wall.F=GEN.OBL	in front

aa	gaayii	hai
come	go.PFV.F	be.PRS.3SG

'That woman has now come in front of that fence.' (production task; 161023-184141)

As before, we observe the use of the numeral *ek* for introducing referents into the discourse which can be subsequently picked up. (195)(a) is uttered when the consultant is presented with a picture of a man standing in front of a well. The well is introduced with the use of the numeral *ek* in an existential construction: *ek kua hai* 'there is a well'. It is immediately picked up clause-initially with a demonstrative as a reference point for the introduction of the man's referent.

This pattern is followed for the rest of the task. The speaker repetitively introduces new referents with the help of *ek* 'one' in the immediately preverbal/precopular position. Information that acts as a background against which a new referent is introduced is fronted without fail. (195)(b) is uttered upon seeing the next picture in which the same man is now standing in front of a fence. *Vo aadmii* 'that man' is realised initially and the new location of the man *ek jaalii kii divaar ke pich^{h}e* 'behind a fence' is introduced subsequently in preverbal

position. The same pattern is observed in (195)(c) uttered in the context of a new picture which shows the same location but with a new participant; the 'known' location is realised initially (with the help of a demonstrative), relative to which a new participant *ek aurat* 'one/a woman' is introduced in preverbal position. Lastly, in (195)(d) we observe an update of the location of the woman from 'behind' (in (c)) to 'in front of' the fence (in (d)), realised again in preverbal position. In picture description tasks the pattern is very strong: information that constitutes given material is fronted acting as a reference point relative to which an informational update is made.

The initial placement of information that can be retrieved from the context is not surprising. This is in keeping with the cross-linguistically observed tendency for 'given' material to precede 'new' material (see Section 2.3). From a parsing perspective, the initial placement of 'given' material ensures minimising search in the context (Kempson & Cann, 2007). Further, a left-most phrase acts as the basis relative to which any subsequent phrase is interpreted. Hence, the observed strategy in (195) for early realisation of 'given' material relative to which an information update is made.

So far, we have seen that bare subjects make reference to a particular individual that can be retrieved from the context (definite readings) or a prototypical individual (a kind reading) as per world knowledge. In very specific contexts, however, a bare subject could escape discourse-anaphoric readings. Dayal (2004) notes that intonational stress on the focused subject allows an indefinite reading, as shown in (196). She proposes that the indefinite reading arises as a result of focus inducing an existential presupposition; it is a focus-dependent predicative reading in which *aurat* 'woman' predicates something about the presupposed entity.

(196) AURAT Daak laa rah-ii hai
woman mail bring PROG-F be.PRS.3SG
'It's a woman who's bringing the mail.' (Dayal, 2004: 411)

Constructions such as (196) are felicitous in 'marked' contexts such as, for example, corrections[28] where the focused expression replaces an explicit alternative from the presupposed proposition. In my understanding, in such constructions the marked intonational pattern signals to the parser a deviation from the default topic-comment structure that is typically associated with initial bare nominals. Prosodic stress acts as a clear indication to the parser that the initial phrase is in some sense 'highlighted' information. Formally, this is expressed in DS as informing a structural delay until more information becomes available. In other words, material from the parse of *aurat* is put 'on hold' until the rest of the utterance is parsed. While the semantic content from the parse of *aurat* is 'on hold', the rest of the utterance yields the open proposition 'x is bringing the mail' where x is an individual that has the property of being human (i.e. a proposition in which some information is missing, in this case – the subject). Next, the initial bare noun *aurat* 'woman' is interpreted as providing an informational update to the proposition. In the absence of a discourse salient individual that satisfies the descriptive content of *aurat*, the informational update achieved is one that the individual that is bringing the mail has the property of being a woman as opposed to, say, having the property of being a man. What are entertained as focus alternatives in such a context are properties of the individual.

To summarise, this section has concentrated on common noun subject NPs that do not carry an overt case marker. I have shown that a new discourse referent tends to be introduced with the numeral *ek* and can subsequently be picked up with a pronoun, a bare noun or a

[28] Corrective focus is often argued to be a subtype of contrastive focus (Repp, 2010, 2016).

combination of a noun and a demonstrative. When it comes to bare subjects, we saw that they allow a variety of different readings that arise within the interpretation process as a result of the different contexts in which realised.

4.2.3 Objects

Turning to common noun objects, as we saw with subjects the numeral *ek* is often used to establish a new referent. The following extract from the Hindi Emille Webnews corpus shows this clearly. In (197)(a) the object *ek peNTiNg* 'a/one painting' (underlined) introduces a new referent, which is subsequently picked up in (197)(b) with *yeh peNTiNg* 'this painting' (also underlined). In (197)(b) another referent is introduced with the accusatively marked object *ek kaar* 'a/one car' (in **bold**). The pronominal forms *us=kii* and *us=meN* (both in **bold**) refer to this newly introduced referent.

(197) Extract from a news article

(a) turkii=kii pulis=ne mashhur chitrakaar pablo pikaaso=kii
Turkey=GEN.F police.F=ERG famous painter.M Pablo Picasso=GEN.F

chorii gayii ek peNTiNg baraamad kii hai
theft.F pass.PFV.F one painting.F found make.PFV.F be.PRS.3SG
'The Turkish police has found a stolen painting by the famous painter Pablo Picasso.'

(b) ek st^{h}aaniiya samaachaar patra=meN prakaashit riporT=ke anusaar
one local newspaper=in published report=according.to

pulis=ne iraak=kii siimaa=se aa-tii **ek** **kaar=ko** rok-kar
police=ERG Irak=GEN.F border=from come-IMPFV.F one car=ACC stop-CONJ

jab **us**=kii talaashii lii to **us**=meN
when 3SG.OBL=GEN.F search.F take.PFV.F then 3SG.PROX.OBL=in

yeh peNTiNg baraamad huii
3SG.PROX painting.F found be.PFV.F
'According to a report published in a local newspaper, the police stopped a car coming from the Iraqi border, when they searched it, the painting was found in it.' (Hindi Emille Webnews corpus; ehinweb044)

Relative clauses provide a source of interesting observations with respect to the realisation of the numeral *ek* and demonstrative *vo*. In (198)-(199) the numeral *ek* is obligatory due to the postverbal realisation of a relative clause which provides more information about the book. The realisation of *ek* is key as it acts as an indication that the speaker intends to provide more information about the newly introduced referent. For example, in (198) the speaker does not simply describe an event of book-reading (a reading that could come up with a bare common noun in a context with no salient book) but intends to elaborate on the object of reading.

(198) maiN **ek** kitaab paR^{h} rah-ii huuN jo maiN=ne dillii=se
1SG one book.F read PROG-F be.PRS.1SG REL 1SG=ERG Delhi=from

k^{h}arid-ii t^{h}-ii
buy-PFV.F be.PST-F
'I am reading a book I bought from Delhi.' (elicited)

(199) maiN=ne **ek** laRkii dek^{h}-ii jis=ne piilii saaRii pehn-ii t^{h}-ii
1SG=ERG one girl.F see-PFV.F who.OBL=ERG yellow sari.F wear-PFV.F be.PST-F
'I saw a girl which wore a yellow sari.' (elicited)

Similarly, in (200)-(201) the realisation of the demonstrative *vo* is obligatory as it enables the 'wait' for the postverbal relative clause. The role of the relative clause is to provide more information needed for the successful identification of the relevant referent.

(200) maiN **vo** kitaab paR^{h} rah-ii huuN jo maiN=ne dillii=se
1SG 3SG.DIST book.F read PROG-F be.PRS.1SG REL 1sg=erg Delhi=from

k^{h}arid-ii t^{h}-ii
buy-PFV.F be.PST-F
'I am reading that book I bought from Delhi.'

(201) maiN=ne **vo** laRkii dek^{h}-ii jo raam=ke g^{h}ar
1SG=ERG 3SG.DIST girl.F see-PFV.F who Ram.M=GEN.OBL house

aa-yii t^{h}-ii
come-PFV.SG be.PST-F
'I saw that girl which had come to Ram's house.' (elicited)

The choice between *ek* and *vo* has to do with the discourse status of the referent, i.e. with whether the speaker choses to present it as discourse-new or as retrievable from the common ground. With the use of *ek* the speaker instructs for the construal of a new referent with the intention of providing more information about it. With the demonstrative *vo* the speaker instructs for the recall of a discourse referent that is assumed to be shared knowledge between speaker and hearer. Intuitively, the realisation of *vo* aids the 'wait' for the parse of the relative clause which provides information relevant for the identification of the referent.

The situation with bare objects is quite complex as different types of nouns behave differently in object position. The often cited generalisation is that specific objects high on animacy are obligatorily case-marked (de Swart & de Hoop, 2007; Mohanan, 1994). Mohanan argues, in fact, that unmarked human noun objects are always incorporated (Mohanan, 1994: 109). In similar terms, Dayal (2011) treats examples such as (202) as an instance of pseudo-incorporation of the bare unmarked object *bachchaa* 'child'. In contrast, a bare *=ko* marked

object picks a salient individual from the discourse, as indicated with the definite translation in (203).

(202) anu bachchaa samb^{h}aal-t-ii hai
Anu.F child.M manage-IMPF-F be.PRS.3SG
'Anu looks after (one or more) children.' (Dayal, 2011: 127; adapted transcription and glosses)

(203) anu bachche=ko samb^{h}aal-t-ii hai
Anu.F child.M.OBL=ACC manage-IMPF-F be.PRS.3SG
'Anu looks after the child.' (Dayal, 2011: 127; adapted transcription and glosses)

On the other hand, bare inanimate objects allow a range of readings. This is reflected in the translations of (204)-(207) (translations are all from the original sources). Mohanan (1994) shows that bare inanimate objects can be definite or indefinite. Butt (1993) points out that, unlike Turkish (Enç, 1991), bare objects in the preverbal position can be interpreted as a referential definite or an indefinite derived from a generic reading (following Dayal, 1992). Dayal (2011) gives (207) as an example of an incorporated (or 'pseudo' incorporated) reading with a collective predicate.

(204) sunaar=ne anuu=ko haar b^{h}ej-aa
goldsmith.M=ERG Anu.F=ACC/DAT necklace.M send-PFV.M.SG
'The/?a goldsmith sent Anu a/the necklace.' (Mohanan, 1994: 12; transcription and glosses adapted)

(205) anu kitaab paR^{h} rah-ii hai
Anu.F book.F read PROG-F be.PRS.3SG
(i) 'Anu is reading a book/books.'
(ii) 'Anu is reading the book.' (Butt, 1993: 99; transcription and glosses adapted)

(206) adnan=ne roTii paka-yii
Adnan.M=ERG bread.F cook-PFV.F
'Adnan made bread.'
'Adnan made the/a bread.' (Butt, 1993: 95; transcription and glosses adapted)

(207) anu botal ikaTT^{h}aa kar-t-ii hai
Anu.F bottle.F collected do-IMPF-F be.PRS.3SG
'Anu collects bottles.' (Dayal, 2011: 141; transcription and glosses adapted)

The different readings in (204)-(207) show that the interpretation of bare objects is dependent on the context and the construction in which realised. Definite specific readings arise when a salient referent can be retrieved from the discourse context. When no discourse referent is picked up, the nominal is interpreted 'locally', i.e. against the immediate linguistic context, for example the lexical meaning of the verb and verbal morphology. In the perfective in (204), the noun *haar* 'necklace' can receive an (inferred) existential reading ('there is some necklace that the goldsmith sent to Anu'). The habitual reading in (207), on the other hand, asserts the regularity of the event of bottle-collecting, hence the plural reading.

Unlike inanimates, bare unmarked human objects do not lend to definite specific readings. In (208)(a), *laRkii* 'girl' cannot yield a definite reading; in fact, Dayal (2011) argues for an incorporated-like reading, as reflected in the translation ('girl-chosen').[29]

(208) (a) anu=ne apne beTe=ke liye laRkiii cun lii
Anu.F=ERG self's son.M.OBL=for girl.F choose take.PFV.F
'Anu has girl-chosen for her son.'

(b) us=ne us=ko ek sone=kaa chen diyaa
3SG.obl=ERG 3SG.OBL=ACC one gold.OBL=GEN.M.SG necklace.M give.PFV.M.SG
'She has given her a gold necklace.' (Dayal, 2011: 158; adapted transcription and glosses)

[29] The role of aspect needs special attention here for a fuller discussion of nominal interpretation but it is outside of the scope of this thesis. In the perfective, probably to do also with the verb's *aktionsart*, the existence of some chosen girl in (208) is inferred under a telic reading which allows pronominal reference in subsequent discourse; see also the discussion in Dayal (2011). This can be understood as an inferred existential entailment (von Heusinger, 2011) as a result of the aspectual organisation of the event ('there is some girl that Anu chose').

In contrast, bare inanimates do not need to carry the accusative marker *=ko* to be interpreted as picking up a contextually salient referent. The optionality of *=ko* with inanimates is shown with the following extracts from the novel *GunahoN kaa devata* in (209):

(209) Examples with *lifaafaa* 'envelope':

(a) … aur tiisrii **ek** **sundar-sa** **niilaa** **lifaafaa** …
and third one beautiful.M blue.M envelope.M
'… and the third (was) a beautiful blue envelope…'

(b) us=ne itne pyaar=se **lifaafe=ko** chuum-aa …
3SG.OBL=ERG so.much.OBL love=with envelope.M.OBL=ACC kiss-PFV.M.SG
'he kissed the envelope with so much love …'

(c) … chandar=ne man=meN kah-aa aur **lifaafaa** k^{h}ol Daal-aa
Chander.M=ERG mind=in say-PFV.M.SG and envelope.M open put-PFV.M.SG
'… Chander thought to himself (*lit.* 'said in his mind') and opened the envelope.'
(extracts from *GunahoN kaa devataa)*

In (209)(a), the phrase *ek sundar-sa niilaa lifaafaa* 'a/one beautiful blue envelope' introduces a new discourse referent with the help of the numeral *ek* 'one'. It is subsequently picked up with the accusative bare object *lifaafe=ko* in (209)(b), and later with the bare unmarked object *lifaafaa* in (209)(c).

Non-specific readings of objects are generally associated with the immediately preverbal position and are lost when an object is preposed but can be easily retained when postposed (Dayal, 2008; Gambhir, 1981; Mohanan, 1995), as shown in (210)-(211).

(210) Preposed object:

(a) **kitaab** anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.SG
'Anu is reading the book.'

(b) **tofaa** anu=ne ravii=ko b^{h}ej-aa hai
gift.M Anu.F=ERG Ravi.M=DAT send-PFV.3SG.M be.PRS.SG
'Anu has sent Ravi the gift.' (Dayal, 2008: 79; adapted transcription and glossing)

(211) Postposed object:

(a) anu paR^{h} rah-ii hai **kitaab**
Anu.F read PROG-F be.PRS.3SG book.F
'Anu is reading a/the book.'

(b) anu=ne ravii=ko b^{h}ej-aa hai **tofaa**
Anu.F=ERG Ravi.M=DAT send-PFV.3SG.M be.PRS.SG gift.M
'Anu has sent Ravi a/the gift.' (Dayal, 2008: 79; adapted transcription and glossing)

The structures in (210) are not surprising given the default topic-comment partitioning of the Hindi clause, and the cross-linguistically observed tendency for information retrievable from the context to precede material that provides an informational update (the so-called *given-before-new* ordering; see Gundel (1988)). The preferred discourse-anaphoric reading of preposed bare objects stems from the expectation that initially placed phrases act as a link to previous discourse or as the background relative to which an informational update is made. However, Dayal (2008) challenges the empirical generalisation that non-specific indefinite objects cannot scramble. She gives (212) as examples of preposed contrastively focused non-specific objects.

(212) Contrastive focus

(a) KITAAB anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.SG
'Anu is reading a book (not a newspaper).'

(b) TOFAA anu=ne ravii=ko b^{h}ej-aa hai
gift.M Anu.F=ERG Ravi.M=DAT send-PFV.M.SG be.PRS.3SG
'Anu has sent Ravi a gift (not something else).' (Dayal, 2008: 80; adapted transcription and glossing)

The type of contexts in which utterances such as (212) would be felicitous are generally contrastive contexts, and specifically – corrective exchanges. In my experience in elicitation sessions with native Hindi speakers, focused objects are strongly dispreferred in initial position, and only allowed (at least to some degree) when prosodically stressed and used correctively. As discussed in Section 4.2.2 for bare subjects, initial stressed objects are in some sense 'highlighted'. In DS terms this would be formalised in terms of structural uncertainty associated with the parse of the initial phrase. The parser proceeds to derive the open proposition 'Anu is reading x' (for (212)(a)) by parsing the rest of the utterance. This is the moment at which potential alternatives for the missing part of a proposition are entertained. Semantic content that was derived from the parse of the object and was put "on hold" provides the necessary information to update the proposition and derive a truth-conditional formula.

To summarise this section, as with subjects the numeral *ek* and the demonstrative *vo* are used with objects to instruct the parser to establish a new referent or to identify a referent from the context, respectively. Bare unmarked inanimate objects allow a range of readings which are dependent on the context and linguistic construction in which used. Bare unmarked animate (or at least human) objects, on the other hand, do not pick up discourse-old referents. To do so, they need to be used in combination with a demonstrative and/or the marker *=ko*. I turn to a discussion on the *=ko* marker in the next section.

4.3 The *=ko* marker: animacy, specificity or something else?

The distinct behaviour of different types of nouns reflects a challenge observed cross-linguistically often linked to animacy, specificity and/or topichood, namely the phenomenon of differential object marking (Aissen, 2003; Amberber, 2008; Böhm, 2015; Dalrymple &

Nikolaeva, 2011; Enç, 1991; Guntsetseg, 2016; Klein & de Swart, 2011; Malchukov, 2008; Rodríguez-Mondoñedo, 2007; von Heusinger & Kornfilt, 2017).

Hindi aligns with other languages showing differential treatment of the object along a hierarchy of agent-worthiness and the interrelated notion of topic-worthiness (Comrie, 1981; Downing, 2018; Payne, 1997). The hierarchy in Table 9 shows the cross-linguistically observed tendency for elements on the left to be more marked compared to elements on the right: objects high in animacy and definiteness[30] and especially human objects tend to be somehow marked, as opposed to inanimate objects.

Table 9 Agent-worthiness hierarchy (Payne, 1997: 150)

1 > 2 > 3 > 1 > 2 > 3 > proper names > humans >			non-human animates	> inanimates
agreement > pronouns	definite	>	indefinite	

The Hindi patterns align with what the agent/topic-worthiness hierarchy in Table 9 predicts. The *=ko* marker is obligatory with proper names, as shown in (213), as well as with pronouns referring to humans, as in (214), and *wh-* question words asking about a human object, as (215) shows. It surfaces with animate and human common noun objects whose referent is discourse salient (i.e. retrievable from the context), as shown in (216) with the extract from a news article about the actions of a particular tiger. The *=ko* marker attaches obligatorily to discourse-salient individuals that are non-agents. Contextually salient inanimates, on the other hand, are non-

[30] The hierarchy does not include specificity but the notion of specificity has been shown to be instrumental for an account of differential object marking in some languages (Croft, 2003; Enç, 1991). More recently, Dalrymple and Nikolaeva (2011) and Leonetti (2004) relate differential object marking to topicality.

agents by default and marking them as such is redundant. Hence, the non-obligatory realisation of *=ko* with inanimate objects.

(213) Proper names:

(a) miiraa raam=**ko** maar rah-ii hai
Mira.F Ram.M=ACC hit PROG-F be.PRS.3SG
'Mira is hitting Ram.' (elicited)

(b) *miiraa raam maar rah-ii hai
Mira.F Ram.M hit PROG-F be.PRS.3SG
'Mira is hitting Ram.' (elicited)

(214) Pronouns:

(a) miiraa=ne us=**ko** maar-aa
Mira.F=ERG 3SG.OBL=ACC hit-PFV.M.SG
'Mira hit her/him.' (elicited)

(b) *miiraa=ne vo maar-aa
Mira.F=ERG 3SG hit-PFV.M.SG
'Mira hit her/him.' (elicited)

(215) miiraa=ne kis=**ko** maar-aa
Mira.F=ERG who.OBL=ACC hit-PFV.M.SG
'Who did Mira hit?' (elicited)

(216) senaa=ne golii daag-kar baag^{h}=**ko** b^{h}aag-aa-yaa
army.M=ERG bullet.F fire-CONJ tiger.M=ACC run-CAUS-PFV.M.SG
'The army fired a bullet and chased the tiger away.' (EMILLE Hindi Corpus: ehinweb147)

Authors differ with respect to what is the primary factor driving the realisation of *=ko*. Butt (1993) argues that accusative *=ko* is a marker of specificity (following a definition of specificity as in Enç (1991) who treats definites as always specific). According to Dayal (2011) it has to do with uniqueness and familiarity. Singh (1994) argues that a *=ko* marked NP denotes an object that is known to have previously existed. de Swart and de Hoop (2007) argue that

animacy takes precedence over definiteness/specificity; as per their analysis, it is only in the case of less animate nouns that it functions as a definiteness/specificity marker. Dalrymple and Nikolaeva (2011) argue that the realisation of *=ko* with inanimates has to do with the topicality of the object. More recently, along similar lines Montaut (2018) proposes that *=ko* has to do with discourse saliency; a marked object is pragmatically salient and individuated. Somewhat simplifying, a human object is marked with *=ko* when an individuated reading is intended, whereas *=ko* is optional with inanimates irrespective of the intended meaning. Its realisation, however, always co-occurs with an individuated reading of the inanimate.

The argumentation that I follow here is that *=ko* is not to be understood as a specificity marker *per se*. After all, discourse-anaphoric readings for inanimates are not dependent on the realisation of *=ko*. Moreover, (217)-(219) show that indefinite specific human objects do not always carry the *=ko* marker:[31]

(217) maiN=ne hubahu tumhaare jaisii **ek** laRkii dekh-ii
1SG=ERG exactly 2PL.POSS like.F one girl.F see-PFV.F
'I saw a girl just like you.' (elicited)

(218) maiN=ne **ek** laRkii dek^{h}-ii jis=ne piilii saaRii pehn-ii t^{h}-ii
1SG=ERG one girl.F see-PFV.F who.OBL=ERG yellow sari.F wear-PFV.F be.PST-F
'I saw a girl which wore a yellow sari.' (elicited)

(219) maiN=ne **vo** laRkii dek^{h}-ii jo raam=ke g^{h}ar
1SG=ERG 3SG.DIST girl.F see-PFV.F who Ram.M=GEN.OBL house

aa-yii t^{h}-ii
come-PFV.SG be.PST-F
'I saw that girl which had come to Ram's house.' (elicited)

[31] The role of aspect needs to be addressed as well but this goes beyond the scope of this thesis.

Rather, *=ko* acts as an indicator of an NP boundary and as such it 'pushes' for the interpretation of the NP with whatever information has been made available to the point of parsing *=ko*. This means that the marker itself does not mark specificity; its role is simply to compile all available information for the parse of the NP. Informally, the role of *=ko* can be defined as the instruction: "everything you need to know for the interpretation of the NP is already provided". The effect is that with bare common nouns it triggers a search in the context for a suitable referent. To give an example, consider (220)-(222).

(220) maiN=ne kal[32] chiriyaag^{h}ar=meN (**ek)** safed sher[33] dek^{h}-aa
1SG=ERG yesterday zoo=in one white tiger.M see-PFV.M.SG
'I saw yesterday a white tiger in the zoo.' (elicited)

(221) maiN=ne kal chiriyaag^{h}ar=meN **ek** safed sher=**ko** dek^{h}-aa
1SG=ERG yesterday zoo=in one white tiger=ACC see-PFV.M.SG
'I saw yesterday a white tiger in the zoo.' (elicited)

(222) maiN=ne kal chiriyaag^{h}ar=meN safed sher=**ko** dek^{h}-aa
1SG=ERG yesterday zoo=in white tiger=ACC see-PFV.M.SG
'I saw yesterday the white tiger in the zoo.' (elicited)

(220) shows that the drop of *ek* 'one' with the unmarked NP *safed sher* 'white tiger' will not lead to ungrammaticality (an individuated reading is stronger with *ek*). In both (221) and (222) the object is marked with *=ko*. The difference between the two examples is in the realisation of *ek* and thus in the discourse status of the object referent. While in (221) the referent introduced by *ek safed sher* is discourse-new, the absence of *ek* in (222) favours an interpretation in which the object referent is 'old' for the interlocutors, i.e. the fact that there is a white tiger in the zoo is treated as shared knowledge between the speaker and their addressee. In effect, as there is no quantifier or demonstrative in (222), the realisation of *=ko* 'pushes' for

[32] *kal* can be translated as either 'yesterday' or 'tomorrow' depending on the context.
[33] *sher* can be translated as either 'tiger' or 'lion'.

the identification of some available referent from the context, leading to the intuition that *safed sher=ko* yields a definite reading.

The use of *=ko* with some verbs leads to slight nuances in meaning. For example, native speakers share intuitions that a *=ko* marked bare noun in combination with the verb *banaa-* 'make' leads to a change in verbal meaning. This is illustrated in (223)-(225):

(223) (a) raam kyaa kar-t-aa hai
Ram.M what do-IMPF-M.SG be.PRS.3SG
'What does Ram do?'

(b) raam kursii banaa-t-a hai
Ram.M chair.F make-IMPF-M.SG be.PRS.3SG
'Ram makes chairs.' (elicited)

(224) (a) raam baahar lakRi=se kyaa kar rah-aa hai
Ram.M outside wood=with what do PROG-M.SG be.PRS.3SG
'What is Ram doing outside with the wood?'

(b) kursii banaa rah-aa hai
chair.F make PROG-M.SG be.PRS.3SG
'(He) is making a chair.'

(225) (a) raam baahar kursi=ke saath kyaa kar rah-aa hai
Ram.M outside chair=GEN.OBL with what do PROG-M.SG be.PRS.3SG
'What is Ram doing outside with a/the chair?'

(b) vo kursii=**ko** banaa rah-aa hai
3SG chair.F=ACC make PROG-M.SG be.PRS.3SG
'He is repairing/fixing the chair.'

In (223)(b) *kursii* 'chair' is uttered in a context with no discourse salient term that satisfies the nominal's description. As previously discussed, imperfective morphology yields a habitual reading describing multiple occurrences of the event of chair making (hence, the English plural translation of *kursii* 'chair'). Similarly, in (224)(b) the focus is on the event of chair making

and no specific chair is referred to. The *=ko* marker in (225)(b) attaches to an object which refers to an entity whose existence is already established in the discourse. Given that the *=ko* marked object *kursii* refers to an entity whose existence is established ahead of processing the whole predication, the verb needs to be re-interpreted as 'fixing/repairing' the chair rather than 'making' it.

The *=ko* marker also surfaces with non-specific indefinites as in (226) and (227). Such examples are said to refute specificity-based accounts of differential object marking and instead support explanations of the distribution of a differential object marker based on a [+human] feature (Leonetti, 2004). The subjunctive mood, for example, in (227) acts as a clear indication that the speaker has no particular boy in mind; the relative clause provides information as to the specific kind of boy that the speaker is looking for. These examples do not refute the analysis of *=ko* proposed here. Adopting a left-to-right procedural approach to grammar, the role of *=ko* is simply to indicate the end of the NP and 'compile' information provided by the quantifier and the noun at the time of parsing the marker and thus ahead of parsing the verb.

(226) jab maiN kisii suNdar bachche=**ko** dek^{h}-t-ii huuN
when 1SG some.OBL beautiful child.OBL=ACC see-IMPF-F be.PRS.1SG

to use uT^{h}aa le jaa-ne=kii ichch^{h}aa ho-t-ii hai
TO 3SG.ACC pick.up take go-INF.OBL=GEN.F desire.F be-IMPF-F be.PRS.3SG
'When I see a/some beautiful child, then (I get) the desire to pick it up.' (EMILLE Hindi corpus; ehinweb2df)

(227) maiN **ek** **aise** laRke=**ko** d^{h}uund rah-aa huuN jo
1SG one such.OBL boy.OBL=ACC search PROG-M.SG be.PRS.1SG REL

subah=ke samay mere kutte=kaa d^{h}yaan rak^{h} sak-e
morning=GEN.OBL time 1SG.POSS.OBL dog.OBL=GEN.M attention keep can-SBJV.3SG
'I am looking for a boy (*lit.* one such boy) that can look after my dog in the mornings.' (elicited)

Further examples are given in (228) and (229). The use of the demonstrative in (228) is obligatory. If dropped, as in (229), the relative clause is infelicitous. From the perspective of incremental parsing, this is because *=ko* pushes for the identification of a suitable term from the context at the time of parsing the object *assistant=ko*. The demonstrative, on the other hand, allows the 'wait' for the relative clause. In DS terms, the demonstrative projects a placeholder in need of substitution with a value from preceding or subsequent discourse.[34] Upon parsing the main clause in (229), the still 'empty' value of the demonstrative acts as an instruction that the parse is not complete, and more information follows.

(228) raam **us** assistant**=ko** D^{h}unR^{h} rah-aa hai
Ram.M 3SG.DIST.OBL assistant.F=ACC search PROG-M.SG be.PRS.3SG

jis=kii angrezii achch^{h}-ii ***ho / hai**
who.OBL=GEN.F English.F good-F be.SBJV / be.PRS.3SG
'Ram is looking for the/that assistant whose English is good.' (elicited)

(229) raam assistant=ko D^{h}unR^{h} rah-aa hai (# jis=kii angrezii achch^{h}-ii hai)
Ram.M secretary.F=ACC search PROG-M.SG be.PRS.3SG
'Ram is looking for the assistant (#whose English is good.)' (elicited)

Now, consider (230) and (231). In both, the object *billii* 'cat' carries the *=ko* marker but is associated with different readings:

(230) manushyoN=ne kariib 12 hazaar saal pehle
human.being.PL=ERG close.to 12 thousand years before

billii=**ko** paaltuu banaa-yaa
cat.F=ACC domestic make-PFV.M.SG
'People domesticated the cat close to 12 thousand years ago.' (Extract from news article [1])

[34] Much more can be said about Hindi relative clauses with respect to different word order possibilities, but this would take me too far afield. The interested reader is referred to Srivastav (1991).

(231) raam=ne billii=**ko** pakaR nahiiN sak-aa
Ram.m=ERG cat=ACC catch NEG can-PFV.M.SG
'Ram couldn't catch the cat.' (elicited)

In (230) reference is made to the cat as a species, whereas (231) is to be uttered in a context which allows reference to some specific cat that Ram tried to catch. Thus, these two examples show exactly what we observed with animate subjects: the *=ko* marked animate object in (230) and (231) gives rise to a kind reading and a definite specific reading, respectively. (230) is not a counter-example to the generalisation that *=ko* indicates a structural boundary. In the absence of a pragmatically salient individual, *billii=ko* in (230) is understood to refer to a prototypical individual with the properties of being a cat, making use of world knowledge. In (231) reference is made to a contextually salient cat whose referent is retrievable from the interlocutors' common ground. Both uses can be understood in terms of von Heusinger's (2013: 349) saliency theory of definites: the bare *=ko* marked nouns in (230) and (231) identify a "representative" element of the set of cats as per the given situation and (assumed) shared knowledge about the world.

Further uses of *=ko* which relate to world knowledge are given in (232)-(234):

(232) chaaNd kitnii koshish na kar-e
moon.M how.much.F try.F NEG do-SBJV

vah **raat=ko** din nahiiN banaa sak-t-aa
3SG night=ACC day NEG make can-IMPF-M.SG
'No matter how much the moon tries, it cannot turn the night into a day.' (Extract from *GunahoN kaa Devataa*)

(233) kaii maukoN=par sattaa=ne bol-ne=kii aazaadii=**ko**
many opportunity.PL.OBL=on power=ERG speak-INF.OBL=GEN.F freedom.F=ACC

dabaa-ne=kaa prayaas kiyaa hai
control-INF.OBL=GEN.M effort.M do.PFV.M.SG be.PRS.3SG
'On many occasions power has made effort to control freedom of speech.' (Extract from news article [2])

(234) bachche na paidaa kar-ne vaale[35] pati-patnii
child.PL NEG born do-INF.OBL VAALAA.OBL husband-wife

bachchoN=ke bagair jiivan=**ko** aasaan maan-t-e haiN
child.PL.OBL=GEN.OBL without life=ACC easy consider-IMPF-PL.M be.PRS.PL
'Non child-bearing spouses consider life without children easy.' (extract from EMILLE Hindi corpus; ehinweb2df)

(232) relates to *=ko*'s use with unique entities whose existence is independent of what is predicated of them, such as the moon, the sun, the sky and abstract nouns such as death and time (as also noted by Montaut (2018) who lists such uses). The extract from a newspaper article in (233) shows the use of *=ko* with the complex NP *bolne kii aazaadii* 'freedom of speech' which describes a specific kind of freedom. In (234) *=ko* attaches to the complex NP *bachchoN=ke bagair jiivan* 'life without children' which refers to a specific kind of life.

To summarise, at first glance the uses of *=ko* with direct objects seem varied and are a challenge to explain in a uniform fashion. The generalisation that I propose is that interpretive effects associated with the use of *=ko* arise as a result of its role as an indicator of a structural boundary in interaction with whatever information the context provides up to the point of parsing *=ko*. This can be information retrievable from the context, including assumed shared knowledge about the world, or the 'local' linguistic context such as a quantifier. The puzzle is not so much, thus, the contribution of *=ko* but the different behaviour of different types of nouns, namely the special status of human nouns. What is not immediately clear is how to capture formally the different behaviour of different types of common nouns and the different readings that they allow. I make first steps towards this is Section 4.5 but a formulisation would have to await future work. For one, to tell a fuller story the role of aspect also needs to be

[35] In this example, v*aalaa* is in its oblique form and attaches to the oblique infinitival form of the verb *kar-* 'do'. See Montaut (2004) who describes the uses of *vaalaa* as an adjectival suffix.

addressed. In what follows I give an overview of existing approaches to nominal interpretation in Hindi/Urdu.

4.4 Previous work on nominal interpretation

Dayal has worked extensively on nominal interpretation in Hindi (Dayal, 1992, 1999, 2004, 2008, 2011, 2017a, 2018). In a recent paper she writes:

> "The empirical generalisation based on Hindi is that bare nominals are ambiguous between definites and kind terms and that bare plurals, but not bare singulars, can have kind derived indefinite readings. The indefinite readings available to bare singulars must be traced to external factors". (Dayal, 2018: 1)

The cited paragraph shows the stance she takes and develops in a series of papers on the topic. I focus here only on Hindi singular bare nominals. The empirical overview presented in Section 4.2 aligns with Dayal's findings that Hindi bare nominals show a variety of readings. She argues for bare nominals to be treated as definite (with object level predicates) or kind-denoting (with kind level predicates), but not indefinite. The observed indefinite effects are to be treated as derivative on particularities of the constructions in which they arise.

To establish the definitenesss of bare nominals Dayal (2017a, 2018) follows a series of tests. She gives (235) as an example of the definiteness of bare nominals where the first sentence acts as the context against which the second is interpreted:

(235) ek laRkaa aur ek laRkii kamre=meN aa-ye laRkii bait^{h} gayii
one boy.M and one girl.F room=in come-PFV.PL.M girl.F sit go.PFV.F
'A boy and a girl came into the room. The girl sat down.' (Dayal, 2017a: 87; adapted transcription and glosses)

Note that in (235) a new referent is introduced with the help of the numeral *ek* 'one' preceding the nouns *laRkaa* 'boy' and *laRkii* 'girl'. The second mention of *laRkii* functions as a discourse-anaphoric expression picking up the already existing referent. Similarly, in an earlier paper

Dayal (2011) points out that the *=ko* marked object in (236) yields a definite reading, as opposed to the unmarked object *bachchaa* 'child' in (237) (repeated from (202)).

(236) anu bachche=ko samb^{h}aal-t-ii hai
Anu.F child.M.OBL=ACC manage-IMPF-F be.PRS.3SG
'Anu looks after the child.' (Dayal, 2011: 127; adapted transcription and glosses)

(237) anu bachchaa samb^{h}aal-t-ii hai
Anu.F child.M manage-IMPF-F be.PRS.3SG
'Anu looks after (one or more) children.' (Dayal, 2011: 127; adapted transcription and glosses)

The second criteria she follows for establishing the definiteness of Hindi bare singular nouns is the homogeineity test (following Löbner, 1985) according to which definites behave like proper names in that incompatible properties cannot be predicated of them, as shown with the unacceptability of (238):

(238) Homogeineity test:

#kuttaa so rah-aa hai aur kuttaa b^{h}auNk rah-aa hai
dog.M sleep PROG-M.SG be.PRS.3SG and dog.M bark PROG-M.SG be.PRS.3SG
'The dog is sleeping and the dog is barking.' (Dayal, 2018: 5; transcription and glosses are adapted)

She argues against the indefiniteness of Hindi bare nominals with a test of partitive specificity (Enç, 1991). In the English example in (239)(a) we observe a felicitous sequence of two sentences. The indefinites *a boy* and *a girl* in the second sentence are interpreted as belonging to the set of children in the room. In contrast, the Hindi example in (239)(b) shows that the second sentence with the bare nominals *laRkaa* 'boy' and *laRkii* 'girl' is infelicitous in the context of the first sentence. Dayal explains that the unacceptability is due to the expectation for a unique boy and girl which the context does not provide.

(239) Partitive specificity test:

(a) There were several kinds in the room. A boy and a girl were playing cards.

(b) kamre=meN kaii bachche t^h-e #laRkaa aur laRkii taash k^hel rah-e t^h-e
room=in several kid.PL be.PST-PL boy.M and girl.F cards play PROG-PL be.PST-PL
'There were several kids in the room. #The boy and the girl were playing cards' (Dayal, 2018: 6; transcription and glosses are adapted)

Having established that bare Hindi nominals fail indefiniteness tests, she argues that indefinite readings are to be understood as a result of noun-external factors. Indefiniteness is not inherent to the bare singular noun but is to be "associated with incorporation and/or complex predicate formation, a process that targets direct objects" (Dayal, 2017a: 92). For example, see (240) and (241). In (240) *kitaab* 'book' is associated with an indefinite reading, uttered in a context in which there is no contextually salient book. In (241) the indefinite reading of *laRkii* 'girl' arises as a result of incorporation.

(240) (a) What were you doing yesterday afternoon?

(b) main kitaab paR^h rah-ii t^h-ii
1SG book.F read PROG-F be.PST-F
'I was reading a book.' (Dayal, 2017a: 91; adapted transcription and glosses)

(241) anu apne beTe=ke liye laRkii dek^h rah-ii hai
Anu.F self.OBL boy.OBL.M=for girl.F look PROG-F be.PRS.3SG
'Anu is girl-looking for her son.' (Dayal, 2015: 71; adapted)

Another source of indefinite readings, as per Dayal (2017, 2018), is the existential construction. The examples in (242) show that (in)definiteness correlates with syntactic position. *Chuuhaa* 'mouse' in (242)(a) is read as indefinite. However, when *chuuhaa* is realised in initial position it yields a definite reading, as shown in (242)(b).

(242) Existential constructions:

(a) kamre=meN chuuhaa hai
room.OBL=in mouse.M be.PRS.3SG
'There is a mouse in the room.'

(b) chuuhaa kamre=meN hai
mouse.M room.OBL=in be.PRS.3SG
'The mouse is in the room.' (Dayal, 2018: 11; transcription and glosses are adapted)

Dayal notes a further complication to the empirical generalisation with the example in (243). Unlike (242)(a), *buuRhii aurat* 'old woman' in (243) is preferably realised with the numeral *ek* 'one' (Dayal, 2017a: 92) to yield an indefinite reading.

(243) #kamre=meN buuR^{h}-ii aurat hai
room.OBL=in old-F woman.F be.PRS.3SG
'There's an old woman in the room.' (Dayal, 2018: 11; transcription and glosses are adapted)

Dayal does not provide an explanation for the different behaviour of *chuuhaa* 'mouse' and *buuRhii aurat* 'old woman' in existential constructions and notes that this is currently not understood very well:

> "Why should the switch from *čūhā* 'mouse' to *būṛhī ɔrat* 'old woman' make a difference to indefiniteness? The bare plural counterpart […] would be quite acceptable. This suggests again that bare singulars in existential contexts are dependent on factors independent of quantificational properties of the noun phrase, factors that are not very well understood currently." (Dayal, 2018: 11)

In earlier work, Dayal (2011) shows more examples of human NPs behaving differently. With *har* 'every' only inanimates such as *kitaab* 'book' can remain unmarked. This is illustrated in (244) where *har kitaab* 'every book' can be optionally marked with *=ko*. In contrast, the drop of *=ko* in (245) with the human noun *bachchaa* 'child' leads to ungrammaticality.

(244) anu har kitaab(=ko) paR^{h}-egii
Anu.F every book.F=ACC read-FUT.F.3SG
'Anu will read every book.' (Dayal, 2011: 127; transcription and glosses are adapted)

(245) anu *har bachchaa / har bachche=ko samb^{h}aal-t-ii hai
Anu.F every child.M every child.M.OBL=ACC look.after.IMPF-F be.PRS.3SG
'Anu looks after every child.' (Dayal, 2011: 127; transcription and glosses are adapted)

Having established that bare nominals in Hindi are ambiguous between kinds and definites, Dayal (2018) proposes a Neo-Carlsonian account (Carlson, 1977) of the observed facts, according to which operations that yield kind, definite and indefinite readings are universal (see also earlier work, for example Dayal, 1999). Following Chierchia (1998) and Partee (1987), there are three operators *iota*, *nom* and ∃ (as defined in Chierchia, 1998) which turn a common noun of type <e,t> into an argument of type <e> or <<e,t>t>.

The *iota* operator encodes the uniqueness of definites. The English definite article *the* is a lexicalised *iota* (*ι*) operator. Hindi lacks a specialised definite article and *iota* operates as a covert type-shift which, Dayal argues, captures the observation that bare singulars pick out unique referents identifiable to the interlocutors. *Nom* is a kind-forming operator; it picks out a unique maximal entity that instantiates the kind. However, the *nom* operator is not responsible for kind readings of Hindi bare singulars. Dayal argues that it is exactly the *iota* operator that is at play again. For example, in (246) the kind term is formed by the combination of *iota* with the taxonomic kind, the tiger, a sub-type of a mammal (see also Dayal, 2004).

(246) sher vilupt ho jaa sak-t-aa hai
tiger.M extinct be go can-IMPF-M.SG be.PRS.3SG
'The tiger can become extinct.' (Dayal, 2017: 90; adapted glosses and transcriptions)

To explain why Hindi bare singulars also allow indefinite readings, Dayal argues that these readings are construction specific and due to the fact that Hindi bare nouns also act as

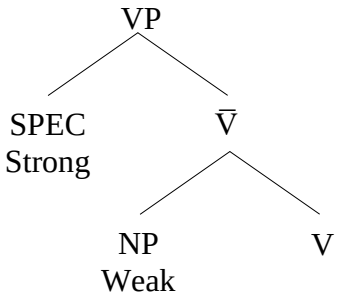
predicates. In object position a predicative term of type <e,t> feeds into the meaning of the verb and receives existential force (see Dayal, 2017: 96). This captures the subject-object asymmetry observed; indefinite readings arise as a result of the incorporating verb taking properties rather that individuals as its internal argument (see also Dayal, 2004; Dayal, 2011). However, while noted in passing, the analysis does not explain the different behaviour of different types of nouns. Dayal (2011) explains that animates are a good guide for exploring incorporation in Hindi as opposed to inanimates because bare inanimates are not always instances of incorporation irrespective of syntactic position.

Butt (1993) takes a more syntactic approach to object interpretation. She notes that in (247) the bare object can be interpreted as a referential definite or an indefinite. The indefinite reading is an instantiation of a kind-level interpretation describing an event of 'book-reading'. When the object is definite, an individual-level reading is instantiated, also understood as an instance of predicate modification (following de Hoop, 1992).

(247) anu kitaab paR^{h} rah-ii hai
Anu.F book.F read PROG-F be.PRS.3SG
'Anu is reading a book/books/ the book.' (Butt, 1993: 99)

To account for the two different readings, Butt follows Ramchand (1993) who proposes two distinct phrase structure positions for objects where each corresponds to a Strong and Weak structural Case assignment (de Hoop, 1992), respectively. These are shown in (248).

(248) Structural object positions, following Ramchand (1993)



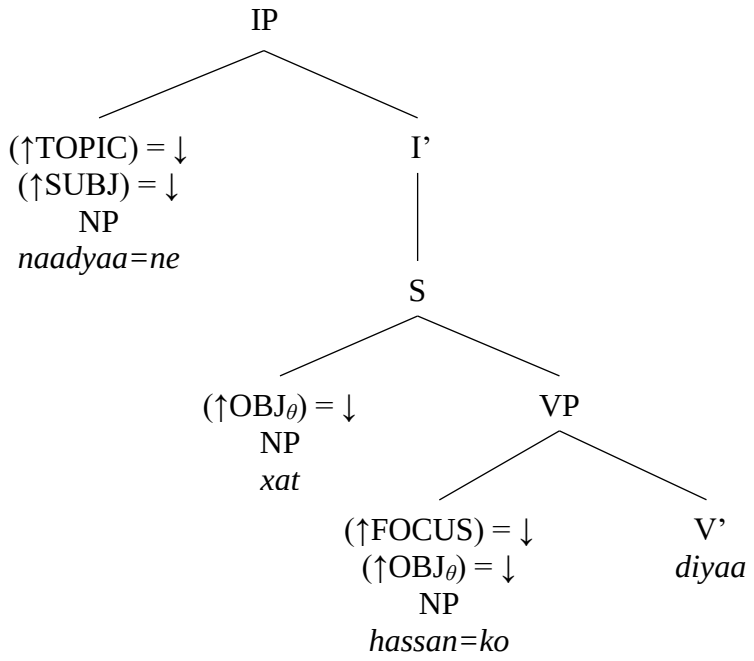
(from Butt, 1993: 98)

When the object is used to refer to an individual book, it appears in the Spec of VP position where it receives Strong Case. Weak structural case is assigned in the complement position of the verb; a Weak Case marked NP is not a 'true' argument and receives a non-specific reading.

A similar position is taken in Butt and King (1996) who present an LFG analysis of object interpretation in Urdu. Butt and King posit that there is a syntactic and semantic distinction to be made between two types of objects formulated in terms of distinct grammatical functions, OBJ and OBJ$_\theta$. The OBJ function corresponds to weak Case and is associated with a non-specific interpretation, it can only be nominative (i.e. unmarked). OBJ$_\theta$ is semantically enriched and corresponds to strong Case yielding specific readings and can be nominative or accusative. Syntactically, the two functions are assigned distinct structural position: OBJ needs to be realised immediately preverbally and occupy the SpecVP position, while OBJ$_\theta$ is free to appear in any position. Objects that are not immediately adjacent to the verb do not occupy the SpecVP position and cannot be assigned the OBJ function and are thus interpreted as specific, as in (249).

(249) (a) naadyaa=ne [xat] [hassan=ko]$_F$ diyaa
Nadya.F=ERG letter.M.NOM Hassan.M=DAT give.PFV.M.SG
'Nadya gave Hassan a particular letter.'

(b)



(Butt & King, 1996: 12-13)

Interestingly, Butt and King argue that focus and OBJ are mutually exclusive as both are licensed in the same structural position. This means that for an object to be in focus, it has to be specific and in the preverbal position. It is, therefore, assigned the OBJ_θ function. Non-specific objects are semantically incorporated and focus on the object implies focus on the whole predicate. Therefore, a semantically incorporated object assigned the OBJ function cannot be in focus alone. Under their analysis (preverbal) non-specific objects would always fall under predicate focus and are strictly restricted to occurring in the immediately preverbal position.

However, Dayal (2008) challenges the empirical generalisation that indefinite non-specific objects cannot scramble. Following Vallduví (1992), she argues that leftward scrambled nominals provide a link to discourse (Vallduví's link-focus structure corresponds roughly to 'topic-comment' or 'predicate focus' structures discussed in Chapter 2). The Link provides the address for which an informational update is made. This captures the inappropriateness of (250)(c) in the context of the question in (250)(a). The scrambled object

(the link) in (250)(c) needs to refer to a contextually salient book which the given context does not provide.

(250) Leftward scrambling: Link elements

(a) anu kyaa kar rah-ii hai
Anu.F what do PROG-F be.PRS.3SG
'What is Anu doing?'

(b) anu kitaab paR^{h} rah-ii hai
Anu.F book.F read PROG-F be.PRS.3SG
'Anu is reading the book.'

(c) #kitaab anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading the book.' (Dayal, 2008: 84)

The semantics of contrastive focus, however, allows leftward scrambling of non-specific objects, as in (251)(a) and (251)(b). (251)(a) is an example of a contrastively focused object, invoking alternatives such as {book, newspaper, magazine}, and (251)(b) – of a contrastively focused subject associated with an alternative set such as {anu, ravi}. In both, the scrambled object *kitaab* 'book' is non-specific. Although Dayal (2008) does not state this explicitly, the type of contexts she describes mean that the utterances in (251) would be intended as corrections where the focused part performs an informational update to some part of a contextually available proposition (see Chapter 2).

(251) Leftward scrambling and contrast

(a) KITAAB anu paR^{h} rah-ii hai (ak^{h}baar nahiiN)
book.F Anu.F read PROG-F be.PRS.3SG newspaper.M NEG
'Anu is reading a BOOK (not a newspaper).' (Dayal, 2008: 84)

(b) kitaab ANU paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading a book, not Ravi.' (Dayal, 2008: 85)

Specific fronted objects comply readily with the discourse requirements of Ground: Link structures as they refer to a contextually salient entity which acts as a link to previous discourse. The rest of the utterance provides an information update for the linked element. When it comes to non-specific fronted nominals, they can also be understood as Ground elements by virtue of pointing out a wrong entry for a member of the alternatives set. For example, in (251)(b), the entry '*is reading a book*' is assigned to a wrong member of the set evoked by focus. The update function corrects the address associated with the entry.

In short, Dayal shows that scrambling possibilities are tied to the discourse context. Fronted nominals are to be construed as Links to previous discourse. This can be a link to some previously established entity in the discourse (observing definite specific readings) or a link bridged by contrast either on the fronted nominal or some other expression. As Dayal (2008) notes, however, rightwards scrambling easily allows both specific and non-specific objects in postverbal position which still awaits characterisation and formal analysis.

The studies discussed so far on Hindi/Urdu propose analyses that take a static view on nominal interpretation focusing on isolated sentences and not giving the context a role in determining interpretation. There has been a move in recent semantic theory to a more 'dynamic' view on how meaning is constructed representing it as growth of informational context (Peregrin & von Heusinger, 1995; von Heusinger, 2004). Such a stance is also taken by scholars working within the Dynamic Syntax framework where the interpretation process is contextually informed.

4.5 Towards an analysis

So far, I have attempted to provide a brief overview of the empirical facts when it comes to nominal interpretation in Hindi by drawing on examples collected for this thesis, as well as examples from previous work, and have hinted on the type of analysis that can be pursued once a parsing-based perspective is adopted.

I have argued that Hindi shows clear patterns when it comes to strategies for introducing new discourse referents and picking up contextually salient referents. Typically, a new salient individual is introduced with the use of the numeral *ek* 'one' preceding the noun, especially when the speaker intends to present more information about the individual. In subsequent discourse, it can be picked up with a pronoun, a bare noun or a combination of a demonstrative and a noun. In the absence of a specialised definite or indefinite article, bare nouns allow a range of different readings that are dependent on the discourse context but also relate to the grammatical function of the NP, the aspectual organisation of the event, as well as intrinsic properties of the nominal itself. To further complicate matters, Hindi shows differential treatment of objects, often explained in terms of the generalisation that only objects high in animacy and/or specificity are case-marked, as opposed to non-specific objects which do not carry a case-marker. In short, any formal account of nominal interpretation has to consider: (1) properties intrinsic to the nominal to account for their differential treatment in object position, as well as (2) the context in which the nominal is realised which includes the discourse context but also the immediate linguistic context (i.e. particularities of the construction in which realised). Much more empirical work remains to be done but I outline possible directions for a formal analysis.

4.5.1 Common nouns and context-dependence

When it comes to bare nouns in Hindi, I propose that there are two domains relevant for their interpretation. First, there is the discourse context which is scanned for relevant information that satisfies the description of the common noun. Definite readings are the result of the availability of such a contextually salient individual, and can be modelled as entirely context-dependent, much like the way pronouns pick up a suitable term from the context. If a term is not available in the discourse context, then the bare noun's contribution is evaluated against the emerging 'local' propositional context, i.e. the string of words amongst which realised and their semantic contribution.

The proposal is in keeping with Egli and von Heusinger (1995) and Peregrin and von Heusinger (1995) who represent both definite and indefinite descriptions as epsilon terms drawing on English examples (see also von Heusinger, 1997; von Heusinger, 2004). The difference between definites and indefinites is simply interpretational and relates to the NP's function in context: informally, the indefinite article "a/an" introduces a new individual, whereas the definite "the" refers to a contextually salient individual. This deviates from sentence-based approaches in which definites and indefinites are assigned static meanings. Instead, meaning here is construed 'dynamically':

> "[…] both definite and indefinite descriptions will be interpreted via choice functions. Their analyses will differ in three important respects, however. First, indefinite NPs are represented by local or "minimized" choice functions, while definite NPs are represented by global choice functions. Second, each indefinite NP introduces a new local choice functions, while all definites are interpreted according to one global choice function. Third, the local choice function for indefinite NPs are static, while the global choice function for definite is dynamic, i.e. it is updated in the discourse." (von Heusinger, 2004: 311)

Von Heusinger (2004) represents definite NPs as epsilon terms interpreted by a global choice function which stands for the salience structure of the context (as discussed in Chapter 3,

Section 3.4.3.1) and has to do with the interlocutors' common ground. This means that the epsilon term for a definite NP *the F* denotes the most salient individual with the property *F* as per the context in which realised. Indefinite NPs also behave like terms but they introduce a new choice function defined only for the set that corresponds to the descriptive material of the indefinite (see Heusinger, 2004: 312). In short, an indefinite noun phrase *a(n) F* chooses an arbitrary representative of the set of *F* which becomes the most salient representative. The definite noun phrase *the F* in subsequent discourse refers to the chosen salient representative element.

What corresponds to von Heusinger's definition of local choice function is the contribution of the numeral *ek* 'one' in Hindi. I assume that the numeral *ek* 'one' acts as an existential quantifier which aids the creation of a new term and binds a fresh variable projected by the common noun. Hindi does not show a specialised overt marker that indicates a global choice function of the likes of the English definite article *the.* Instead, the contribution of a common noun is evaluated against the discourse context. If there is a contextually available epsilon term that satisfies the descriptive material introduced by the noun (i.e. picks a contextually salient individual of the set), this leads to the so-called definite specific readings of bare nouns. If no epsilon term is identified from the context, the contribution of the nominal is evaluated with respect to particularities of the local context (for example, this could be captured in terms of a dependency on a local event term).

This allows to capture straightforwardly the different readings of bare inanimates, such as *kitaab* 'book', as entirely context-dependent: nouns project a variable which is interpreted against the context in which realised. If an appropriate epsilon term that satisfies the restrictor can be retrieved from the context, this leads to discourse-anaphoric readings. If no epsilon formula can be re-used from the context, then the nominal's contribution is evaluated with

respect to the immediate 'local' context assigning an arbitrary entity leading to intuitions of indefinite and/or incorporated-like readings with certain predicates and aspect values. A detailed formulisation of the effects of tense-aspect information and event term construal, however, would have to await future work.

An outstanding problem is the distinct behaviour of animates and human objects in particular. The challenge is explaining formally why individuated bare human objects require an overt realisation of an NP boundary but discourse-anaphoric inanimates do not. From a functional perspective, the 'special' status of human objects might stem from a strong dispreference for any ambiguity associated with human expressions. Inanimates, whether specific or non-specific, do not compete for an agent role; they are by default non-prominent event participants. They do not initiate events, neither are affected by events in the same way as humans. Humans, being prominent event participants and likely agents, are to be assigned a role in the event as unambiguously as possible. The marker *=ko* has a key role in this respect by indicating a non-agent role, i.e. a human participant that undergoes or is affected by the event. The effect of marking a bare human noun acts as an indication for a prominent participant triggering a 'search' in the context for the identification of an individual that satisfies the description.

It is not immediately obvious how to model the difference between inanimates and human common nouns. One possible way to do this is to posit that inanimates project a full specification of a context-dependent epsilon term. Human common nouns, on the other hand, project only some partial specification (for example, only a predicate restrictor) showing a stronger local dependency for their interpretation.

Of course, much more work remains to be done and this chapter only scratches the surface. The discussion here is far from a thorough investigation of nominal interpretation in

Hindi. First, quantification was not discussed, and second a larger range of constructions need to be addressed. Also, properties of different types of nouns themselves need to be explored further, as well as the effects of aspectual information on nominal interpretation. Nonetheless, the discussion so far has shown general tendencies when it comes to the interpretation of unmarked objects and has argued for a 'dynamic' analysis that accounts for the heavily context dependent nature of nominal interpretation and the left-to-right basis in which information accumulates. In what follows, I take first steps towards applying the Dynamic Syntax formal tools for an account of Hindi nominal construal.

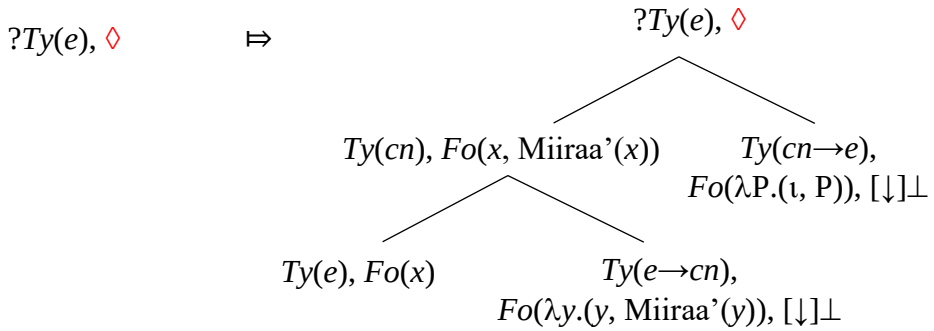
4.5.2 Term construal and anaphora in Hindi

In keeping with previous work within Dynamic Syntax, all NPs, whether quantified or not, are considered to be of type *e* but project a complex internal structure. So far, I have only discussed the contribution of Hindi proper names (see Chapter 3, Section 3.4.3). Proper names project a *iota* 'ι' term construed as an epsilon term picking out a unique witness, as shown in (252)-(253).

(252) Lexical entry of *Miiraa*

Miiraa	IF	?*Ty*(*e*)
	THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*cn*→*e*), Fo(λP.(ι, P)), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e*→*cn*), *Fo*(λy.(y, Miiraa'(y)), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), put(*Ty*(*e*), Fo(*x*)), go(⟨↑$_0$⟩), go(⟨↑$_0$⟩)
	ELSE	Abort

(253) Structure projected by *Miiraa*



The lexical actions projected by *Miiraa* in (252) result in the structure in (253). These were discussed in more detail in Chapter 3 and will not be elaborated further. The internal structure, however, will often be omitted throughout this thesis in tree representations when not needed.

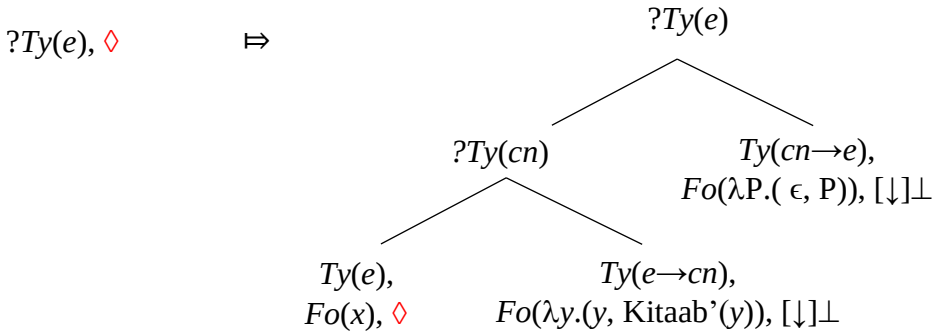
Hindi shows that bare nouns can act as arguments which suggests that they alone can project a type *e* expression. As proposed for other determinerless languages within DS, such as Chinese and Japanese (Kempson & Kurosawa, 2009; Liu & Kempson, 2018; Wu, 2011), inanimate nouns in Hindi are assumed to project a full skeletal template of an epsilon term from a type-*e*-requiring node (see Chapter 3, Section 3.4.3.1 where epsilon terms were first discussed). The lexical entry for *kitaab* 'book' is given in (254). Note that the lexical actions specified are partial as they do not account for the parse of *kitaab* in the context of the numeral *ek* or a demonstrative. The lexical entry will be revised shortly to reflect other contexts in which the nominal can be parsed.

(254) Lexical entry of *kitaab* (partial)

kitaab	IF	…	
	ELSE	IF	?*Ty*(*e*)
		THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Fo*(λP.(ϵ, P)), *Ty*(*cn*→*e*), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(?*Ty*(*cn*)), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e*→*cn*), *Fo*(λ*y*(*y*, Kitaab'(*y*))), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(*x*))
		ELSE	Abort

The lexical actions in (254) construct from a ?*Ty*(*e*) node a skeletal epsilon term which has complex internal structure, as shown in (255). It consists of a variable node (type *e*), a restrictor node (type *e*→*cn*) and a binding-operator node (type *cn*→*e*):

(255) Parsing *kitaab*



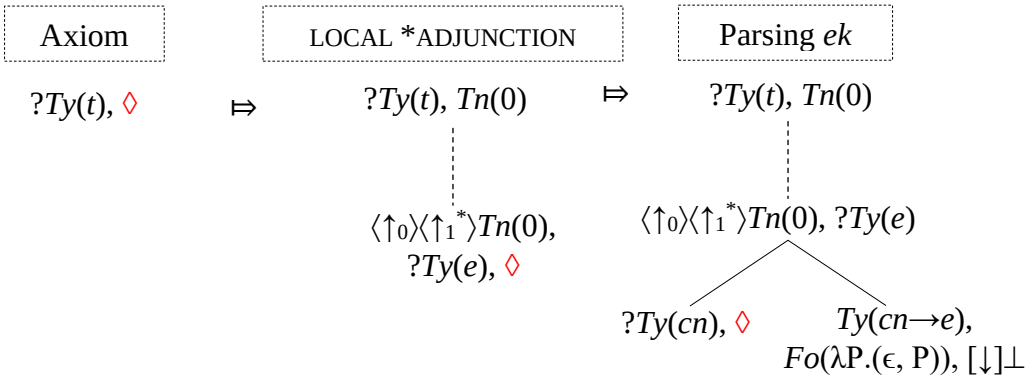
Unlike English, a bare common noun such as *kitaab* 'book' in Hindi projects not only the variable and restrictor, but the epsilon operator as well which picks out an element from the set described by the restrictor. If the set is empty the epsilon operator assigns an arbitrary entity.

The numeral *ek* 'one' acts as an existential quantifier which aids the creation of a new term and binds a fresh variable projected by the common noun. The lexical entry of *ek* is given in (256) (ignoring here other uses of the numeral). The effect of parsing *ek* from the axiom is illustrated in (257).

(256) Lexical entry of *ek*

ek	IF	?*Ty*(*e*) ∧ ⟨↑*⟩*Tn*(*n*)
	THEN	make(⟨↓1⟩), go(⟨↓1⟩), put(*Fo*(λP.(ϵ,P)), *Ty*(*cn*→*e*), [↓]⊥), go(⟨↑1⟩), make(⟨↓0⟩), go(⟨↓0⟩), put(?*Ty*(*cn*))
	ELSE	Abort

(257) Parsing *ek* 'one' from axiom



The first line of the lexical entry ensures that *ek* is parsed on an unfixed node in the context of a requirement for type *e*. Starting from a type-*e*-requiring node, *ek* builds a functor node and contributes information about the form of quantification. Just like the English indefinite article *a/an* the numeral *ek* projects an epsilon term on the node of type *cn*→*e*. It also builds a node of type *cn* from the type-*e*-requiring node leaving the pointer there.

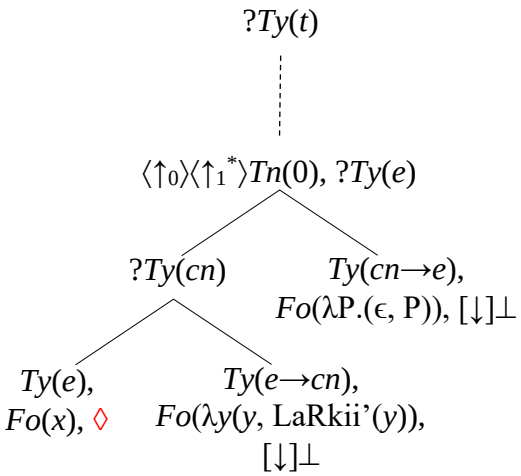
The pointer is now at the right place for the parse of a common noun such as *laRkii* 'girl'. The lexical entry for *laRkii* is in (258) (the lexical entry is partial as it does not specify all contexts in which the common noun can be parsed; it only shows a scenario where the noun is encountered in the context of a requirement for type *cn*).

(258) Lexical entry for *laRkii* (partial)

laRkii	IF	…	
	ELSE	IF	?*Ty*(*cn*), ⟨↑$_0$⟩?*Ty*(*e*)
		THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Fo*(λ*y*(*y*, LaRkii'(*y*))), *Ty*(*e*→*cn*), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Fo*(*x*), *Ty*(*e*))
		ELSE	Abort

The first line of the lexical entry of *laRkii* states that the parse can proceed if the pointer is at a node decorated with ?*Ty*(*cn*), i.e. a requirement for a node of type *cn*. Continuing with the parse in (257), the lexical entry instructs the pointer to build a functor node from the *cn*-requiring node and decorate it with the complex lambda term λ*y*(*y*, LaRkii'(*y*)), as well as an argument node of type *e*, decorated with a variable, resulting in the structure in (259).

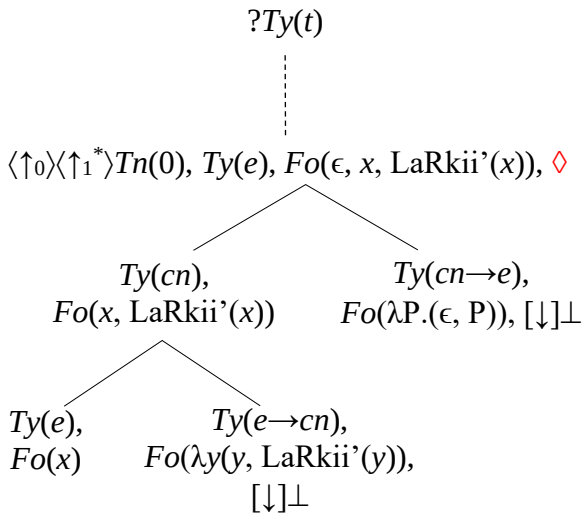
(259) Parsing *ek laRkii*



The pointer is left at the variable node from where it can proceed up an argument relation via COMPLETION (computational rules were introduced in detail in Chapter 3). ELIMINATION decorates the *cn* node with *Ty* and *Fo* values, satisfying the requirement ?*Ty*(*cn*). THINNING applies to delete the satisfied requirement associated with the node and via COMPLETION the

pointer moves to the top ?*Ty*(*e*) node. As before, ELIMINATION applies decorating the node with complete type and formula decorations which allows the next step of THINNING. The yielded structure is given in (260).

(260) Parsing *ek laRkii:* completing the type *e* node



For an utterance such as (261)(a) the derivation can proceed with the parse of the perfective verb *aa-yii.* After compiling the propositional formula, the epsilon term is evaluated to yield the formula in (261)(b) where α stands for 'there is some girl that came' (I am ignoring tense and aspect specifications here). The newly construed epsilon term can be picked up in subsequent discourse by anaphoric expressions that satisfy the description, such as a pronoun as in (262).

(261) (a) ek laRkii aa-yii
one girl.F come-PFV.F
'A girl came.'

(b) LaRkii'(α) ∧ Aa'(α)
where α = (ϵ, *x*, LaRkii'(*x*) ∧ Aa'(*x*))

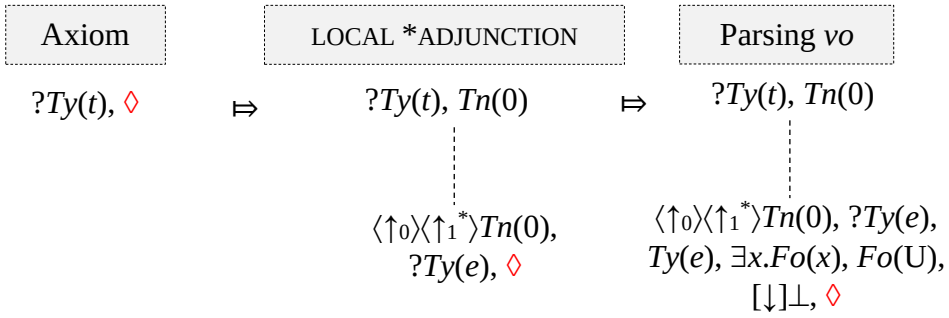
The pronoun *vo* in (262) projects a metavariable U as a *Fo* value. This metavariable is simply a placeholder and is associated with the requirement ∃x.Fo(x) which states that the node must find an appropriate formula value. The lexical entry for the pronoun *vo* is given in (263). It is parsed in the context of a requirement for an expression of type *e*. If this requirement is satisfied, it projects the following decorations: a type *e*, a metavariable, a requirement that the node finds a formula value and a bottom restriction. The effect of parsing *vo* is shown in (264).

(262) vo ak^{h}baar paR^{h} rah-ii t^{h}-ii
3SG newspaper.M read PROG-F be.PST-F
'She was reading a newspaper.'

(263) Lexical entry for pronoun *vo*

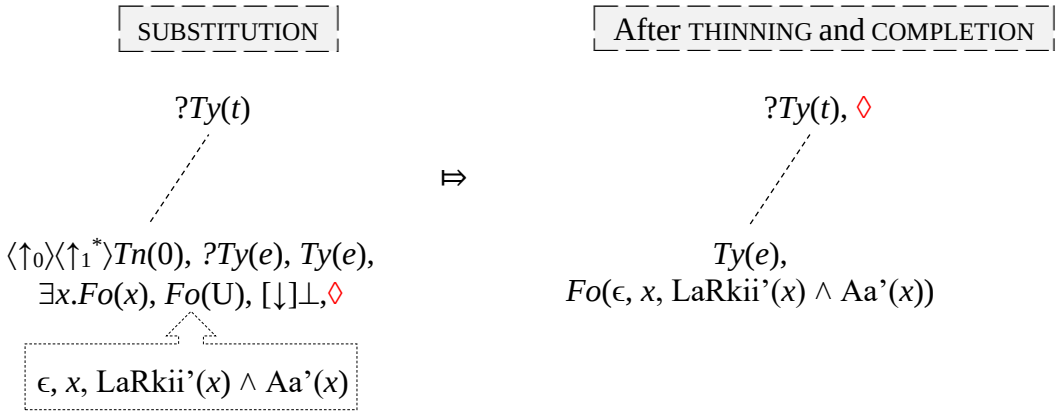
vo	IF	?*Ty*(*e*)
	THEN	put(*Ty*(*e*), *Fo*(U), ∃*x*.*Fo*(*x*)), ⊥[↓]
	ELSE	Abort

(264) Parsing *vo*



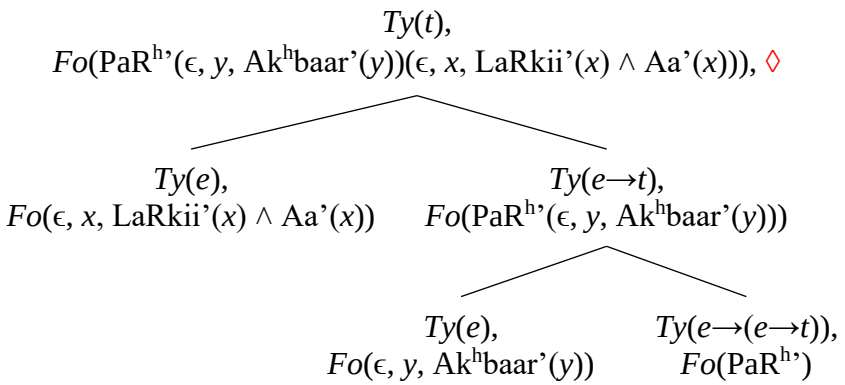
Next, the pragmatic process of substitution can take place to replace the metavariable value projected by *vo* with whatever information is available from the context. Uttered in the context of (261), this is the epsilon formula value ϵ, *x*, LaRkii'(*x*) ∧ Aa'(*x*) for 'there is some girl that came'. This allows satisfying the *Ty* and *Fo* requirements associated with the unfixed node. THINNING and COMPLETION apply, leaving the pointer at the root node.

(265) Parsing *vo*



The final completed tree for the parse of (262) is given in (266), ignoring tense and aspect specifications for now. A step by step detailed account of the parse of verbs and tense-aspect carrying auxiliaries is postponed for Chapter 5.

(266) Parsing *vo ak^{h}baar paR^{h} rahii t^{h}ii* ('She was reading a newspaper.')



Demonstratives are analysed in similar terms as pronouns. They also project a metavariable in need of pragmatic enrichment. However, the common noun provides a restrictor for possible substitution values. For (267), the demonstrative *vo* projects a metavariable restricted by the common noun *laRkii* 'girl'. This can be simply represented as Fo($U_{GIRL(U)}$) (see Kempson et al. (2001: 235-239) for more details and Cann (2007: 17) who proposes to analyse English definite noun phrases as involving the construction of LINK structures).

(267) vo laRkii d^hire d^hire chal rah-ii t^h-ii
3SG girl.F slowly slowly walk PROG-F be.PST-F
'That girl was walking slowly.' (elicited)

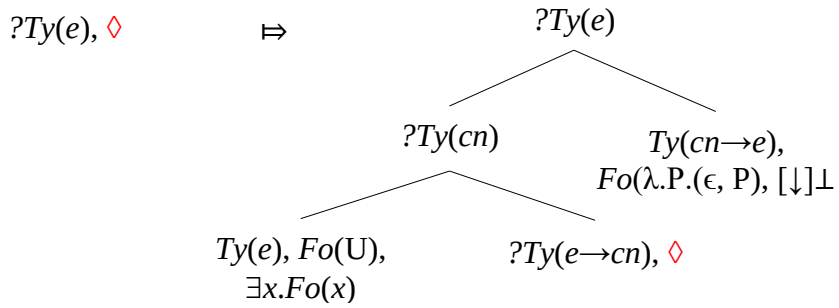
I propose the lexical entry in (268) for the demonstrative use of *vo* which builds a partial epsilon term with a requirement for a predicate restrictor and a metavariable instead of a true variable:

(268) Lexical entry for demonstrative *vo*

vo	IF	?*Ty*(*e*)
	THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*cn*→*e*), *Fo*(λ.P.(ϵ, P)), [↓]⊥) go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(?*Ty*(*cn*)), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(U), ∃*x*.*Fo*(*x*)), go(⟨↑$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(?*Ty*(*e*→*cn*))
	ELSE	Abort

The effect of the lexical actions projected by the demonstrative *vo* is shown in (269). The pointer is left at the restrictor node, ready for the parse of a noun:

(269) Parsing demonstrative *vo*



Note that in this case the common noun is parsed in the context of a ?*Ty*(*e*→*cn*) trigger. This necessitates revisiting the lexical entry for *laRkii* 'girl' to reflect the different contexts in which the noun can be parsed (following Cann (2007) who assumes distinct triggers for the parse of English nouns). The revisited partial lexical entry is given in (270):

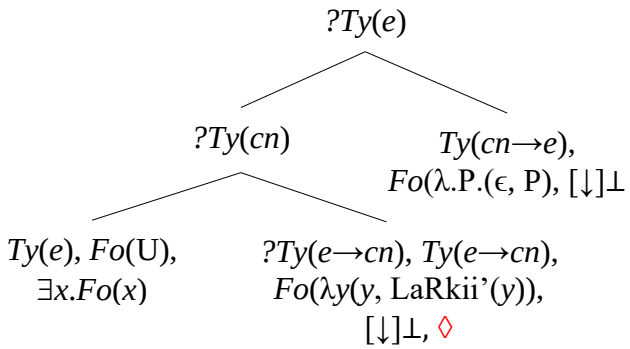
(270) Lexical entry for *laRkii* (revisited)

laRkii	IF	…	
	ELSE	**IF**	**?*Ty*(*cn*), ⟨↑$_0$⟩?*Ty*(*e*)**
		THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Fo*(λ*y*(*y*, LaRkii'(*y*))), *Ty*(*e*→*cn*), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩) put(*Fo*(*x*), *Ty*(*e*))
	ELSE	**IF**	**?*Ty*(*e*→*cn*), ⟨↑$_0$⟩⟨↑$_1$⟩?*Ty*(*e*)**
		THEN	put(*Fo*(λ*y*(*y*, LaRkii'(*y*))), *Ty*(*e*→*cn*), [↓]⊥)
		ELSE	Abort

The lexical entry in (270) defines two possible triggers (in **bold**) for the parse of a common noun such as *laRkii* 'girl': the first is a requirement for a type *cn* and the second – a requirement for a nominal predicate. Continuing with the parse of the noun gives us the structure in (271). After THINNING, COMPLETION and ELIMINATION, the formula decoration *Fo*(U, LaRkii'(U)) is derived at the *cn* node, and *Fo*(ϵ, U, LaRkii'(U)) at the top type *e* node. The metavariable is to

be contextually substituted with a salient term that satisfies the common noun's description, i.e. the property of being a girl.

(271) Parsing *vo laRkii*



In short, the demonstrative is analysed as projecting a metavariable in need of pragmatic enrichment, with the common noun acting as a restrictor stating that substitution of the metavariable can happen only with an element from the set denoted by the predicate.

A side note is necessary here. The example in (262) (repeated in (272) below) in principle under certain prosodic patterns allows a reading in which the subject is dropped and a demonstrative use of *vo* is intended. When the demonstrative use is intended a pause between *vo* and *ak^{h}baar* is inappropriate but acceptable when the pronoun use of *vo* is intended.

(272) Prosody-dependent readings:

vo	ak^{h}baar	paR^{h}	rah-ii	t^{h}-ii
3SG	newspaper.M	read	PROG-F	be.PST-F

Reading 1: 'She was reading a newspaper.'
Reading 2: '(She) was reading THAT newspaper.' (elicited)

This shows that prosody can be given a constructive role by modelling its contribution similarly to case markers as indicating an NP boundary. For Reading 1, prosody instructs the parser that the expression of type *e* can be completed which triggers the pointer to return to the topnode and proceed with the parse of the next lexical item as a separate type *e* expression. For

Reading 2, prosody instructs the pointer that the complex type *e* expression is still under construction. An analysis that reflects the constructive role of prosody would be closer to the empirical facts and would allow a single lexical entry to subsume both uses. In principle, nothing stops us from assuming that the pronoun *vo* also projects a partial epsilon term with a type complete but underspecified predicate restrictor carrying the decorations *Ty*(*e→cn*), *Fo*(λN.(λN)) (where N stands for a nominal predicate of type *e→cn* in need of contextual resolution). In the case of a demonstrative *vo,* the restrictor formula value is contributed by the nominal; otherwise, it is resolved contextually. This is a possible direction of analysis in which a more unified account of the different uses of *vo* can be pursued. This is not immediately needed here so I leave such a formulisation for future work in which prosody is given a more central role. For the time being I assume two distinct lexical entries for the two uses for simplicity.

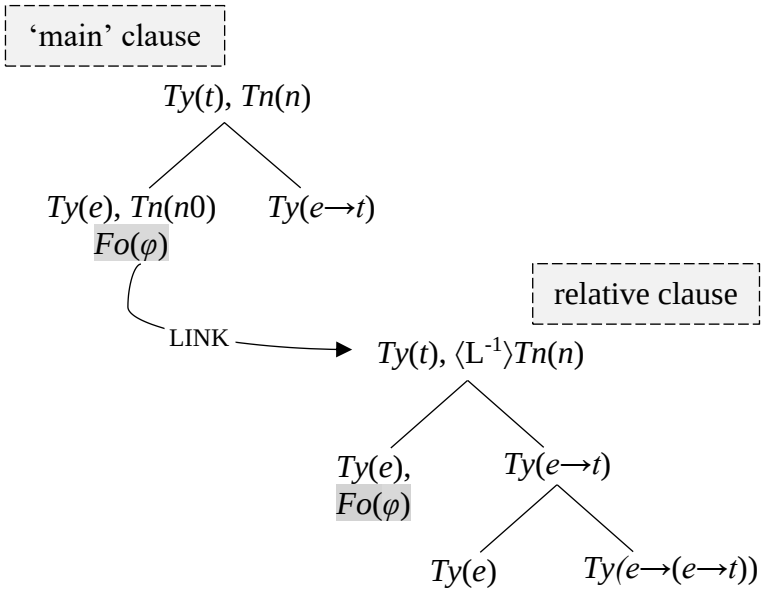
Such an approach to anaphoric expressions like demonstratives opens possibilities for an account of Hindi relative clauses as projecting a parallel (anaphorically 'linked') propositional structure. The metavariable projected by the demonstrative facilitates the sharing of a term between the "main" and the LINKed structure. It introduces an anticipation for update which the relative clause provides. For (273), the LINKed structure will be built from the "head" type *e* node. The NP *vo laRkaa* 'that boy' builds a type *e* node from which a linked structure is projected. Only after the link structure is completed, the parser would return and complete the "main" structure. A simplified sketch is presented in (274) but I leave a detailed analysis for another occasion. The sketch shows the shared semantic content between the two structures (some formula value *Fo*(*φ*)) which constitutes the anaphoric 'link' between the two structures.

(273) Embedded and right adjoined relative clauses:

(a)	**vo**	**laRkaa**	**jo**	sitaa=ko	pyaar	kar-t-aa	hai	amiir hai
	3SG	boy.m	REL	Sita.F=ACC	love	do-IMPF-M.SG	be.PRS.3SG	rich be.PRS.3SG

'The boy who loves Sita is rich.' (Bhatt, 1997: 55)

(274) Sketch of relative clause construal



Note that the correlative construction in (275) will involve a different analysis. The relative pronoun *jo* induces the building of a LINKed structure from the type-*t*-requiring node of the main tree at the very start of the parse, resulting in the 'pairing' of two propositional structures which share semantic content:

(275) The correlative construction:

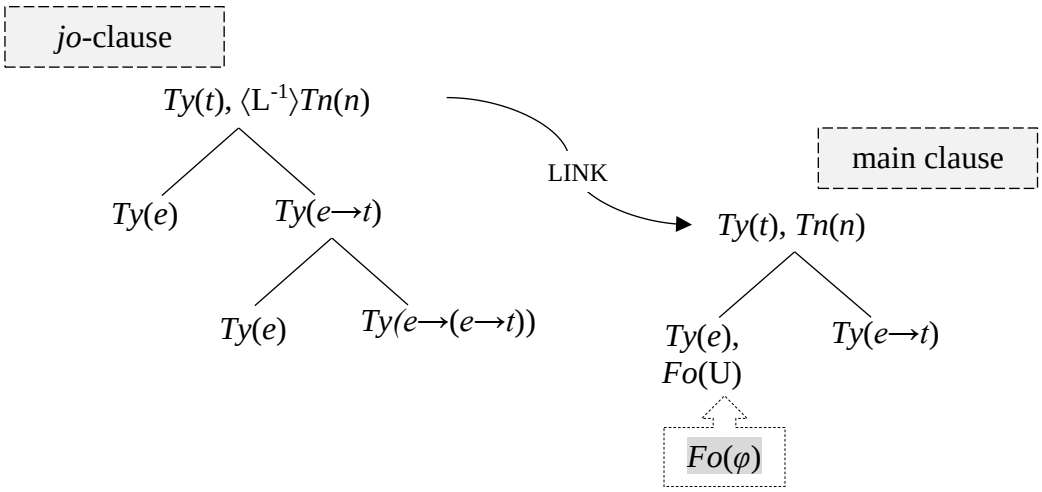
jo	**laRkaa**	sitaa=ko	pyaar	kar-t-aa	hai	**vo**	amiir	hai
REL	boy.M	Sita=ACC	love	do-IMPF-M.SG	be.PRS.3SG	3SG	rich	be.PRS.3SG

'The boy who loves Sita is rich.' (Bhatt, 1997: 55)

Unlike (273), here the LINKed structure is built before any structure is projected at the "main" tree. The pointer returns to the "main" type *t* tree only after the completion of the LINKed tree. This allows for the conjunction derived at the LINKed structure to serve for the interpretation

of the pronominal form in the main tree, much like cross-sentential anaphora. In effect, the construction in (276) shows similarities with left-peripheral topic construal (see Section 4.5.3 of this chapter).[36] The LINKed structure acts as a background against which the "main" tree unfolds and provides a value for the metavariable projected by the pronoun in the main clause.

(276) Sketch of correlative construal



I hypothesise that the pronominal element in the "main" tree is substituted with the epsilon formula ϵ, *x*, LaRkaa'(*x*) ∧ Pyar_kar'(*x*)(Sitaa'), derived at the LINKed type *t* tree. However, these sketches are heavily simplified and a more in-depth account is needed of what semantic content is shared between the parallel structures. I leave this question open as this would necessitate a detailed discussion on relativization in Hindi and a more thorough investigation of properties of the constructions.

What the discussion so far has revealed is that common nouns can be modelled as having complex lexical entries with different triggers to capture their dependence on the immediate linguistic context, i.e. the partial structure under construction. So far, I have argued that bare inanimates project a full skeletal epsilon term from a type-*e*-requiring node to reflect

[36] See Butt, King, and Roth (2007) for an LFG account of Urdu correlatives.

the variety of readings that they allow in different contexts. They also co-occur with the numeral *ek* and the demonstrative which necessitates a revision of their lexical entry to account for this.

(277) Lexical entry for *kitaab* 'book' (revisited)

kitaab	**IF**	**?*Ty*(*e*)**	
	THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Fo*(λP.(ϵ, P)), *Ty*(*cn*→*e*), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(?*Ty*(*cn*)), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e*→*cn*), *Fo*(λ*y*(*y*, Kitaab'(*y*))), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(*x*))	
	ELSE	**IF**	**?*Ty*(*cn*), ⟨↑$_0$⟩?*Ty*(*e*)**
		THEN	make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Fo*(λ*y*(*y*, Kitaab'(*y*))), *Ty*(*e*→*cn*), [↓]⊥), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩) put(*Fo*(*x*), *Ty*(*e*))
	ELSE	**IF**	**?*Ty*(*e*→*cn*), ⟨↑$_0$⟩⟨↑$_1$⟩?*Ty*(*e*)**
		THEN	put(*Fo*(λ*y*(*y*, Kitaab'(*y*))), *Ty*(*e*→*cn*), [↓]⊥)
	ELSE	Abort	

In the revised lexical entry in (277) three IF conditions are formulated. The first is that the pointer is at a node with a requirement or an expression of type *e* (?*Ty*(*e*)). This can be an unfixed node or a node at a LINKed tree of type *e* (as discussed in Chapter 3). If the condition is met, the nominal projects a type *e* node with complex internal structure, including an epsilon operator. If the condition is not met, the lexical entry checks for a requirement for an expression of type *cn* (?*Ty*(*cn*)). Such a requirement can be projected by the numeral *ek* (or another quantifier) and accounts for *ek+noun* combinations. In this case, the nominal projects a variable and a restrictor node. If that condition is also not met, then the lexical entry checks for a requirement for a nominal predicate (?*Ty*(*e*→*cn*)) and projects only a restrictor. This accounts

for *demonstrative+noun* combinations. If none of the conditions are met, then the parse is aborted.

Such an approach to representing NP content is motivated by observations that the interpretation of nouns is heavily context-dependent. A bare inanimate noun projects a complete epsilon term which is assigned a contextually salient "representative" of a non-empty set (intuitions of definite readings). If the set is empty, an arbitrary entity is chosen (indefinite/ incorporated-like readings). When preceded by a quantifier or a demonstrative, the nominal projects only some partial structure, with the quantifier projecting a binding operator and the demonstrative projecting a metavariable associated with an anticipation for contextual update.

The question that remains is what structure does a human noun such as *laRkii* 'girl' project when not preceded by a quantifier or a demonstrative. What we need to do is account somehow formally for the intuition that referential human nouns have a "special status" which in the literature has been described as prominence or topic-worthiness (Comrie, 2003). The same degree of "uncertainty" as to their precise interpretation is not tolerated, especially in predicative position. As prominent event participants, referential human NPs follow stricter patterns when it comes to how a new participant is introduced and how reference to some known participant is made. As discussed in Section 4.2, there is a strong tendency for new referents to be introduced with the use of the numeral *ek* 'one' which construes an epsilon term interpreted by a newly introduced choice function which assigns an arbitrary element of the set described by the noun. Then, a discourse-anaphoric expression in subsequent discourse is interpreted with respect to the newly updated choice function picking up the "chosen" element of the set. This can be a bare subject or a *=ko* marked object, but not a bare unmarked object. The generalisation that can be drawn from this is that while the interpretation of inanimates is left entirely to the pragmatics, human nouns show a stronger dependency on the local context.

In Section 4.5.1 I argued that there are two domains relevant for the interpretation of bare nouns: the discourse context and the local propositional context. Bare subjects typically show a dependency on the discourse context (they are associated with a strong identifiability presupposition; Lambrecht, 2000), or more precisely – on the identification of some term in the context leading to intuitions of discourse-anaphoric readings as per von Heusinger's (2004) global choice function. In other words, unless construed otherwise with the help of a quantifier, the interpretation of a bare human subject is dependent on some term that can be identified contextually.

An unmarked human object is interpreted strictly locally, i.e. against information projected by the immediate string of words such as a quantifier but also against information about the unfolding event predication (type of event described and its aspectual organisation). This can be formulated as a dependency on the local situation epsilon term of type $Ty(e_S)$ (see Section 3.4.3.3) projected by the inflected verb. Such an approach allows accounting for the effects of aspectual information on nominal interpretation: the perfective (together with *aktionsart* information) may have an effect of existential closure on the interpretation of an unmarked object. Structurally, an analysis can be pursued in which the verb together with verbal morphology projects a partial epsilon term on its internal argument node for which the noun provides the restrictor. For Hindi this is not a problem as perfective verbs show agreement with unmarked objects:[37]

(278) anu=ne apne beTe ke liye laRkii chun-ii
Anu=ERG self's son for girl.F choose-PFV.F
'Anu chose a girl for her son.' (Dayal, 2015: 62; adapted glossing and transcription)

[37] Dayal (2015) derives indefinite readings from an incorporation rule which targets direct objects that denote properties. This is the case in (278). A *=ko* marked direct object undergoes covert type shift via *iota* yielding definite readings. See section 4.4 on previous work.

In contrast, the realisation of *=ko* unambiguously points to the end of the NP driving the compilation of semantic content on the noun phrase level with respect to whatever information has been made available for the interpretation of the nominal. This means that a marked object 'escapes' verb-induced existential closure. The effect this has on the interpretation of bare *=ko* marked objects is that it triggers a search for some appropriate term in the context that satisfies the restrictor leading to definiteness and specificity effects, reminiscent of von Heusinger's (2004) global choice function. For an example, see (279):

(279) anu=ne laRkii=ko chun-aa
Anu=ERG girl=ACC choose-PFV.M
'Anu chose the girl.' (Dayal, 2015: 62; adapted glosses and transcription)

I leave the formal technicalities of such an approach for future work as it would necessitate a discussion on scope construal, expressed as dependencies between terms construed within the overall tree structure, and an analysis of incremental event construal representing the contribution of tense and aspect. Nonetheless, in keeping with previous work within DS I treat Hindi NPs as projecting expressions of type *e*.

Alternatively, the model does allow for type ambiguity should an analysis is pursued in which bare human nouns in predicative position denote properties (similarly to Dayal's (2018) argument; see Section 4.4). One possibility is to propose that in the context of a requirement for a predicate a bare human noun projects only a nominal predicate and not a full epsilon term. A variable would then have to be bound through other means, be it a quantifier, the contribution of *=ko* or aspectual information. I leave such details to the side as I am not concerned with an account of incorporated-like readings.

A more structural approach to the contribution of the *=ko* marker and its role as a 'compilator' of semantic content at the NP level is explored in Chapter 5. In what follows I

further emphasise the need for a procedural, contextually informed account of nominal interpretation to capture (in)definiteness effects in the left periphery.

4.5.3 LINK and *Adjunction at the onset of a parse

Left periphery effects are captured in DS in terms of the choice between distinct computational rules, namely the rules of *ADJUNCTION and LINK adjunction (first introduced in Chapter 3). The availability of parsing alternatives is reflective of the wide range of discourse functions that material in the left periphery can perform. Typically, bare common nouns in the left periphery favour definite readings. This is not surprising given the strong association of the initial position with topical material. However, as discussed in Section 4.2 an initial bare nominal may escape definite readings under prosodic stress.

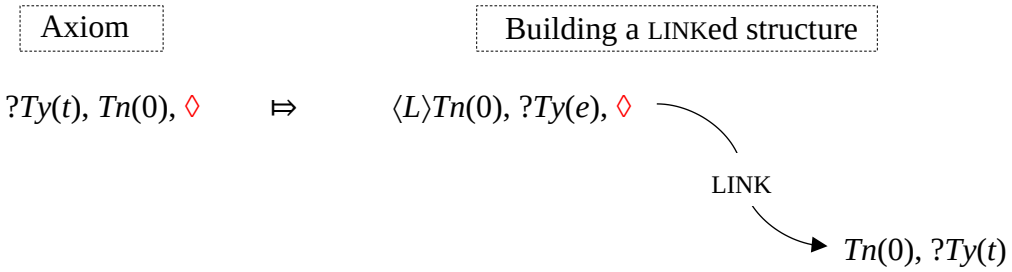
Definite readings of bare subjects are not surprising given that the default subject position and topic position coincide in Hindi, a structural reflex of which (in DS terms) is the building of a LINKed structure at the onset for the parse of a left-peripheral expression which provides the background against which context-updating information is presented. These are the so-called topic-comment structures: the topic is the entity about which the comment part of an utterance provides information. Lambrecht (1994) describes such structures as predicate focus and argues that they are the universally unmarked type of focus structure (see Chapter 2). Each utterance is said to contain focus and the predicate is the unmarked focus domain. The topic-comment structure is, of course, not limited to subject-topic and predicate-focus correspondences, as evident from Bhatt and Anagnostopoulou's (1996) translation of (280):

(280) billii mach^{h}lii k^{h}aa-t-ii hai
cat.F fish.F eat-IMPF-F be.PRS.3SG
(i) 'The cat eats fish.'
(ii) 'Cat, the fish eats.' (Bhatt & Anagnostopoulou, 1996: 14)

The (i) reading of (280) follows the 'default' SOV word order, while (ii) indicates an OSV reading. Each of these word orders would be felicitous in different contexts. (i) can be an answer to a question such as 'Who eats fish?', while (ii) would answer a question such as 'Who eats cats?'. As Bhatt and Anagnostopoulou's translations indicate, structurally there is nothing that precludes either of the readings, provided they are uttered in the right context, although the (ii) reading is pragmatically 'odd' considering world knowledge.

Left-peripheral topic constructions are captured in DS in terms of the building of a LINKed structure at the onset of the parse following the rule of TOPIC STRUCTURE INTRODUCTION (see Section 3.4.2.7 for an introduction to the rule). The rule builds a LINKed structure from a type-*t*-requiring node, moves the pointer there and decorates it with a requirement for type *e*. The resulting structure is shown in (281) where ⟨L⟩ stands for 'linked'.

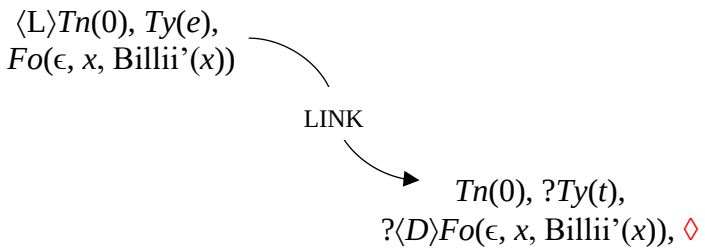
(281) Building a LINKed structure from the axiom via TOPIC STRUCTURE INTRODUCTION



The rule leaves the pointer at the LINKed structure with a requirement for an expression of type *e*. This allows the parse of an initial noun such as *billii* 'cat' in (280). Once *billii* is parsed, the TOPIC STRUCTURE REQUIREMENT rule (see Section 3.4.2.7) applies and moves the pointer to the main type *t* tree. There, it imposes the requirement ?⟨*D*⟩*Fo*(ϵ, *x*, Billii'(*x*)), i.e. a requirement that somewhere in the tree under construction a copy of the term is to be found. The ⟨*D*⟩ operator imposes a very weak structural restriction with no locality constraints. This

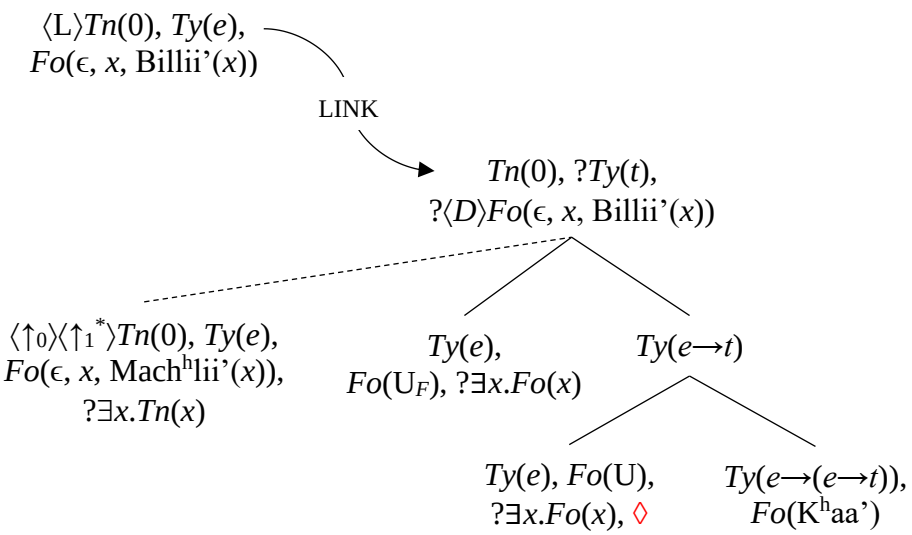
requirement will ensure that the parallel structures are in an anaphoric relation and share semantic content. Otherwise, if the requirement is not satisfied, the string will not be well-formed, and the parse will crash. The result of applying the rule is shown in (282).

(282) Building a LINK structure via the TOPIC STRUCTURE REQUIREMENT rule



The 'LINK' expresses an anaphoric relation between the two parallel structures. The 'main' propositional tree unfolds in the context of information provided by the LINKed tree. With the pointer at the 'main' tree, the derivation can proceed with the parse of *mach*^{h}*lii* 'fish' on a locally unfixed node. Next, the verb in combination with the tense-carrying auxiliary unfold the propositional template and project fixed structure, as in (283). I will postpone a detailed introduction to the lexical entry of verbal elements and the structure they project for Chapter 5. For now, it will suffice to say that the verb projects a fixed propositional template:

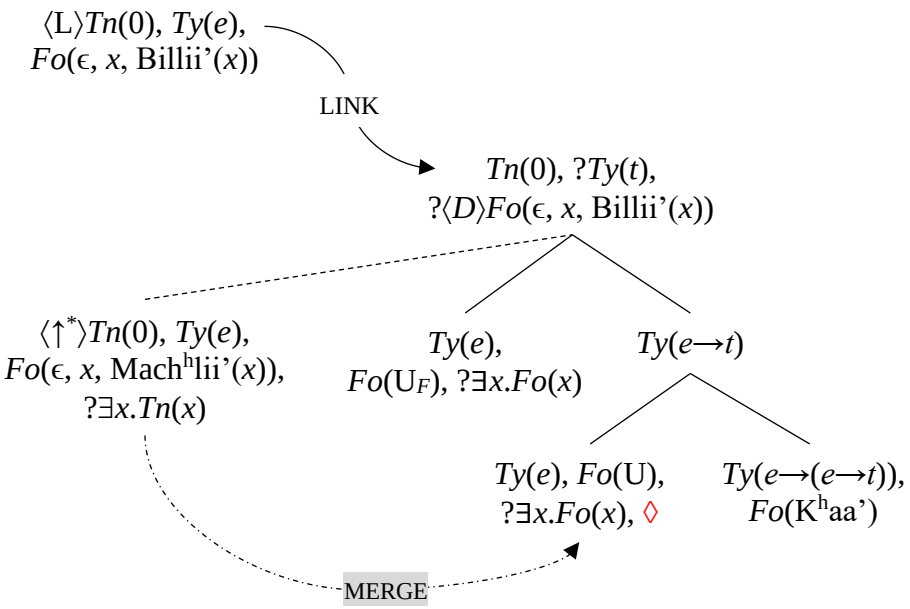
(283) Parsing *billii mach^{h}lii k^{h}aatii hai*



The lexical specifications projected by the verb leave the pointer at the object node decorated with a metavariable in need of pragmatic enrichment. The derived structure in (283) presents two possible routes for how the parse can proceed. The unfixed node can merge with either of the two type *e* argument nodes and either of the metavariables can be substituted with information provided by the context. The possibility for alternative routes by which the parse can proceed reflects the structural ambiguity of (280).

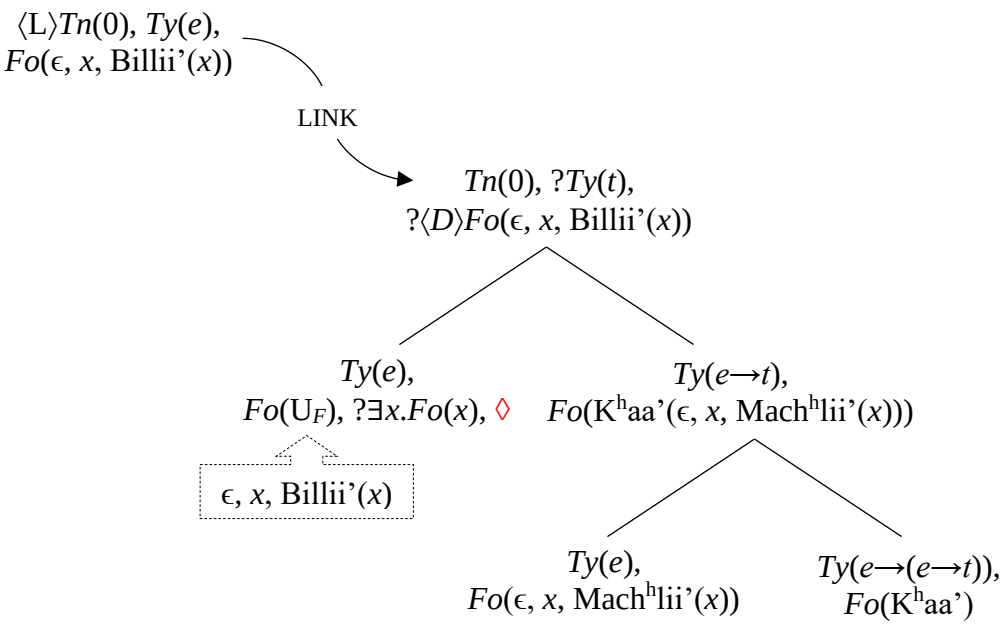
Of course, this does not mean that the human parser has to make structural choices all the time as the context in which the utterance is parsed plays a major role. If (280)(i) is uttered in the context of a question such as 'What does the cat eat?' which yields the open proposition 'the cat eats x', the answer is interpreted against this propositional 'frame' stored in the context resulting in the assertion 'x = fish' (see Chapter 6 for more details on the parse of *wh*-questions). The point of structural update via MERGE is illustrated in (284).

(284) MERGE with internal argument node:



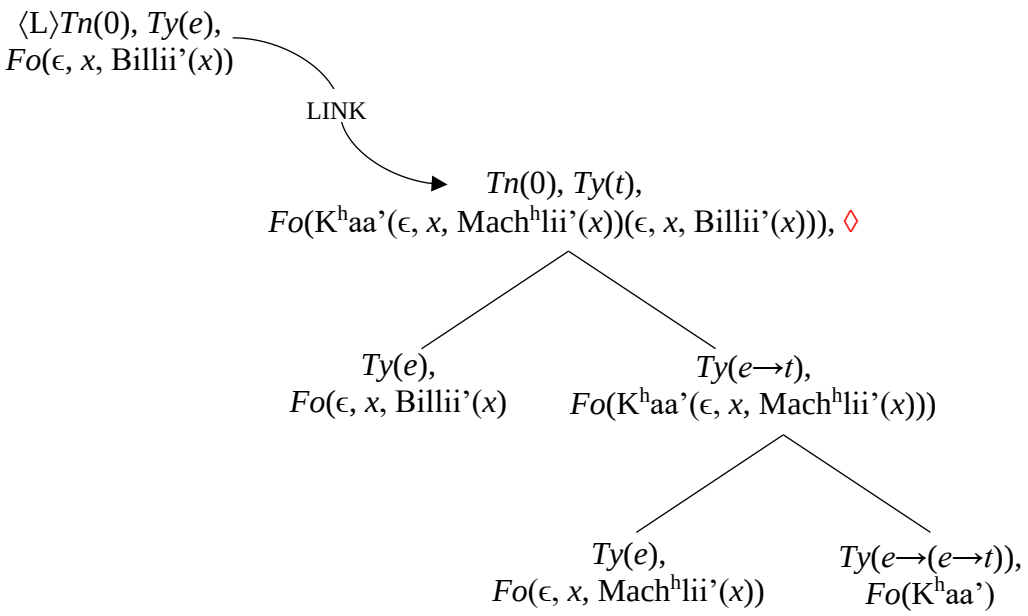
After MERGE, the requirements associated with the unfixed node and the internal type *e* node are satisfied, triggering the application of ELIMINATION and COMPLETION, moving the pointer at the type *e*→*t* node, decorating it with the combined *Fo* value of its daughter nodes. The completion of the *e*→*t* node allows the pointer to move to the top type *t* node. As all requirements at this point are not satisfied, the 'subject' node carries a requirement that the node finds a *Fo* value, the pointer moves to that node via ANTICIPATION. With the pointer there, the metavariable at the node is replaced by a term retrieved from the context via SUBSTITUTION. This is illustrated in (285). In this case, it is the LINKed structure that acts as the context against which the 'main' propositional tree unfolds.

(285) Pragmatic enrichment of external type *e* node:



Finally, via THINNING, COMPLETION and ELIMINATION the pointer moves to the top type *t* node to derive a complete type *t* decoration and the formula value K^{h}aa'(ϵ, *x*, Mach^{h}lii'(*x*))(ϵ, *x*, Billii'(*x*)). The requirement ?⟨*D*⟩*Fo*(ϵ, *x*, Billii'(*x*)) at the top node is satisfied as the tree structure contains a node decorated with the epsilon term. After one more step of THINNING the fully completed tree structure in (286) emerges:

(286) Completed tree structure:



The effect of the MERGE of the unfixed node carrying *Machhlii'* 'fish' with the 'object' node is one of informational update relative to the topic.

Dayal (2004) describes indefinite readings of bare stressed subjects as a predicative reading subscribed to focus. As per her analysis, focus induces the existential presupposition in (287)(b) and the bare noun *aurat* 'woman' "predicates something about the presupposed entity" (Dayal, 2004: 411), as shown in (287)(c).

(287) (a) AURAT Daak laa rah-ii hai
woman mail bring PROG-F be.PRS.3SG
'It's a woman who's bringing the mail.'

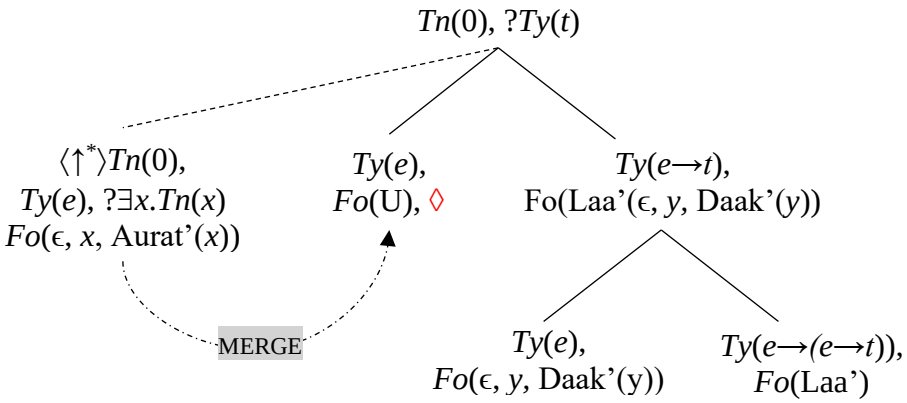
(b) $\exists x$ [is-bringing-mail-today(x)] *presupposition*

(c) woman(ιx [is-bringing-mail-today(x)]) *assertion*

(Dayal, 2004: 411; adapted)

From a DS perspective, stress on the initial argument can be understood as a clue to the human parser for a deviation from routinised topic-comment structures. I propose that the stressed subject in (287) is parsed onto an unfixed node via *ADJUNCTION. The rest of the utterance recalls a proposition which is recognised as already contextually available but with an aspect of it missing. The initial bare NP *aurat* does not refer to a contextually salient individual; it provides material to assert that 'x = woman' as opposed to another explicit alternative. The structure in (288) shows the point at which the fixed 'subject' node finds a *Fo* value via MERGE.

(288) Parsing *AURAT Daak laa rah-ii hai* (simplified)



The same mechanisms are available for the parse of initial objects. Fronted objects are often said to allow only specific readings, as in (289) (repeated from (210)) (Dayal, 2008; Gambhir, 1981; Kidwai, 2000; Mahajan, 1990). This falls out naturally from their topic function as identifying entities about which information is given in the comment. However,

Dayal (2008) argues that non-specific readings in clause-initial position can be preserved under contrast, as in (290):[38]

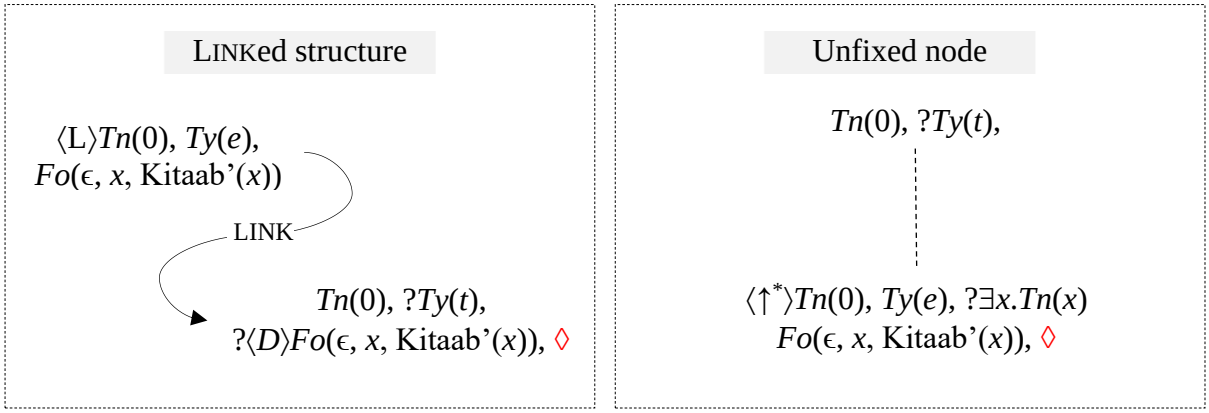
(289) kitaab anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading the book.' (Dayal, 2008: 79)

(290) KITAAB anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading a book (not a newspaper).' (Dayal, 2008: 80)

In elicitation sessions, focused objects in initial position are strongly dispreferred. It is only in corrections (often considered a subtype of contrastive focus; Repp, 2010, 2016), accompanied by intuitions of prosodic prominence, that contextual felicity judgments improve. I hypothesise that the prosodic differences between (289) and (290) reflect the availability of distinct grammar mechanisms at the onset of a parse, namely the building of a LINKed structure and an unfixed node. Therefore, different prosodic patterns can be modelled as informing the choice of a parsing mechanism in the same way as lexical information projects instructions for how the parse proceeds. The two options are illustrated in Figure 3 for the parse of the left-peripheral expression *kitaab* 'book' on a LINKed structure and an unfixed node for (289) and (290), respectively.

[38] Dayal (2003) argues that contrastive focus restores the possibility for a non-specific reading of a nominal scrambled to the left. Her arguments were introduced in Section 4.4.

Figure 3 Parsing options at the onset

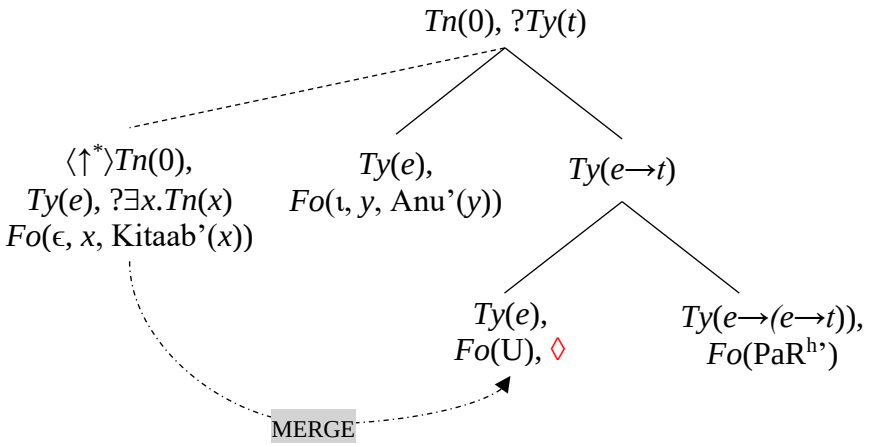


LINK transitions constitute a shift from one structure to another and allow accounting for topic construal as providing some context relative to which an informational update is made. Prosodic stress at the onset of the parse is associated with the building of an unfixed node, which after MERGE will provide an informational update relative to some contextually available propositional structure. In Figure 3 the precise role of the type *e* term is yet undetermined: the LINKed structure simply indicates that something "about" the entity is going to be disclosed, while the unfixed node is associated with the expectation for update. The effect of employing different mechanisms is simply pragmatic; the same truth conditional formula will be derived in the end. The distinct interpretational effects are the result of the different steps taken to derive a proposition relative to the context.

An utterance such as (290) is a very marked construction as the default locus for focal arguments is the immediately preverbal position. In elicitation sessions I have found that such marked constructions are accepted only under contrastive readings with corrections being the preferred strategy for contextualisation. If the default parsing route, as per Lambrecht (1994), is a topic-comment structure, then it is not surprising that deviations from it would necessitate more 'marked' constructions such as prosodic stress. Stress on the initial argument acts as a clear indication that the focus of the utterance does not lie in the preverbal position (its default

association) and thus avoids a comment reading of material realised to the right of the initial NP. The initial stressed NP is parsed onto an unfixed node via *ADJUNCTION and the rest of the utterance yields the open proposition 'Anu is reading *x*'. Such an analysis is in keeping with semantic approaches to focus: there is a point in the parse at which *x* is in need of finding a value. The necessary update is provided by the unfixed node via MERGE, as shown in (291).

(291) Parsing *KITAAB anu paR^{h} rahii hai* (simplified)



4.6 Summary and conclusion

This chapter has explored the range of readings available to bare common nouns in Hindi. However, much more empirical work needs to be done when it comes to the semantics of nominal interpretation. The aim of the chapter was to take first steps in this direction from the perspective of left-to-right parsing and to emphasize the procedural and contextually-informed nature of the interpretation process.

This chapter has shown how (in)definiteness can be treated as an entirely pragmatically determined effect, formally captured as a result of the interaction of contextual information and semantic structure-building mechanisms in utterance interpretation. This allows accounting for

the 'indefinite' interpretation of bare stressed subjects and non-specific readings of fronted stressed objects while retaining type uniformity of nominal expressions.

The chapter also explored the distribution of *=ko* and argued for an analysis of the marker as an indicator of a structural boundary which pushes for the 'completion' of the interpretation of the object NP before the parse of the verb with information that is made available up to the point of parsing *=ko*. Informally, *=ko* acts as an indicator to the hearer that everything needed for the interpretation of the NP is already made available. In the next chapter, I further elaborate on the structural contribution of case markers in Hindi and the finite verb.

5 Dynamic structure building: the role of case and verbal morphology

5.1 Introduction

Having discussed nominals and their interpretation in context, this chapter looks at the contribution of case and verbal morphology in more detail. Hindi poses a challenge for any linguistic theory with a complex case and agreement system that relates to tense-aspect, transitivity, as well as animacy and discourse considerations such as specificity. Hindi does not have an overt nominative marker and has homophonous accusative and dative forms, with the added complication of differential object marking and a complex agreement pattern which allows verbal agreement only with unmarked NPs.

This chapter concentrates on the structural contribution of the Hindi case markers =*ne* and =*ko*. It proposes that they are to be analysed as projecting procedural information, i.e. as giving instructions on how the predicate-argument structure unfolds ahead of parsing the verb. The ergative marker =*ne* instructs the parser that the type *e* node is to find a tree node address

as the immediate argument daughter of a node of type *t.* The accusative/dative *=ko* imposes a restriction that the argument node under development is to find such a tree node address that it is dominated by a predicate type node. Unmarked NPs are associated with structural underspecification which is resolved after the finite verb projects a complete propositional template at the finishing stages of the derivation.

In what follows, Section 5.2 gives an empirical overview of case and agreement marking in Hindi, concentrating on the *=ne* and *=ko* markers. Section 5.3 discusses in brief previous work on the two case markers and explains how the proposed analysis differs from other theoretical approaches. Next, the chapter formalises the claims made with the tools of Dynamic Syntax: Section 5.4 models the contribution of verbs and auxiliaries in non-perfective contexts and Section 5.5 addresses the perfective and the ergative pattern. Finally, Section 5.6 draws a summary and conclusion.

5.2 Empirical overview: case and verbal morphology

5.2.1 Subject marking and agreement

Subjects of future, past/present progressive and habitual clauses do not carry overt case specifications and the verb and auxiliaries show subject agreement. This is illustrated in (292) where the progressive auxiliary *rah-ii* shows agreement with the subject *Nadya* in gender and the present tense auxiliary *hai* shows agreement in person and number. In the future example in (293) the future verb shows agreement with the subject *laRkaa* 'boy' in gender, number and person in the future.

(292) nadya skul jaa rah-ii hai
Nadya.F school.M go PROG-F be.PRS.3SG
'Nadya is going to school.'

(293) laRkaa kitaab k^{h}arid-e-g-aa ak^{h}baar nahiiN
boy.M book.F buy-3SG-FUT-M.SG newspaper.M NEG
'The boy will buy a book, not a newspaper.'

An exception are the so-called 'experiencer subjects' which carry the *=ko* marker (in its dative use) irrespective of the tense-aspect values of the clause, as in (294). 'Unaccusative transitives' (Mohanan, 1994) such as *mil-* 'meet/encounter' in (295) are another exception (note that the *=ko* marked argument is a non-agent in all). However, the subject status of dative arguments in constructions where we have two proper names, as in (295), is not clear (Montaut, 2003) and seems to be strongly linked to the initial position in which they are realised. The important observation here is that verb always agrees with an unmarked NP, irrespective of the type of construction. Dative subject constructions are not the immediate concern of this thesis but see Section 5.2.3 for a brief discussion on the multitude of functions that *=ko* performs.

(294) miiraa=ko gussa aa-yaa
Mira.F=DAT anger.M come-PFV.M.SG
'Mira got angry.' (Lit. 'Anger came to Mira.')

(295) raam=ko pranav mil-aa
Ram.M=DAT Pranav.M meet-PFV.M.SG
'Ram met/encountered Pranav.' (sudden/unexpected meeting)

A further exception to the generalisation that Hindi subjects do not carry an overt marker are perfective transitive clauses where the subject carries the ergative marker *=ne* (for an overview of aspect-based split ergativity in Indo-Aryan, see Butt, 2017). Subjects of intransitive clauses are generally unmarked, as in (296), whereas subjects of transitive clauses obligatorily carry the ergative marker, as shown by the contrast in (297). In this case, the verb shows agreement with the unmarked object *kitaab* 'book'.

(296) Intransitive perfective clause:

(a) raam gayaa
Ram.M go.PFV.M.SG
'Ram went.' (elicited)

(b) *raam=ne gayaa
Ram.M=ERG go.PFV.M.SG
'Ram went.' (elicited)

(297) Transitive perfective clause:

(a) raam=ne **kitaab** k^{h}arid-**ii**
Ram.M=ERG book.F buy-PFV.F
'Ram bought a/the book.' (elicited)

(b) *raam kitaab k^{h}arid-aa / k^{h}arid-ii
Ram.M book.F buy-PFV.M.SG buy-PFV.F
'Ram bought a book.' (elicited)

Intransitive verbs, as in (298), show agreement with the single unmarked argument. Example (299) shows that *=ne* does not surface with *dauD-* 'run' but does attach to the causer when the verb is inflected with causative morphology *-aa-*, as in (300) and (301).

(298) **miiraa** gir-**ii**
Miiraa.F fall-PFV.F
'Mira fell.' (elicited)

(299) **vo** dauD-**aa**
3SG run-PFV.M.SG
'He run.' (elicited)

(300) aap=ko kisi jaanvar=**ne** dauD-**aa**-**yaa** hai
2PL=ACC/DAT some animal=ERG run-CAUS-PFV.M be.PRS.3SG
'Has an animal chase you?' (elicited)

(301) hat^{h}iyoN=**ne** unheN dauD-**aa** di**yaa**
elephant.PL.OBL=ERG 3PL.ACC/DAT run-CAUS give.PFV.M.SG
'The elephants chased them.' (elicited)

A further example of a causative construction is given in (302) where *=ne* has attached to an inanimate NP and the verb shows singular masculine agreement, i.e. the so-called 'default' agreement (Mohanan, 1990, 1994) [39]. Subbārāo (2012) describes the default form as homophonous with third person singular masculine agreement. Other uses of *=ne* include natural forces such as *havaa* 'wind' in (303) where the verb agrees with the feminine NP *tabaahii* 'devastation'. Somewhat related to natural forces is *=ne*'s realisation with the inanimate *patt^{h}ar* 'stone' in (304). As the object *do kaaroN=ko* 'two cars' carries *=ko*, the verb shows default agreement.

(302) … brahmaaṇḍ=ke rahasyoN par un=ki likh-ii kitaab
universe=GEN.M.OBL mystery.PL.OBL on 3PL.OBL=GEN.F write-PFV.F book.F

a brief history of time=**ne** un=ko vigyan jagat=kii
a brief history of time=ERG 3PL.OBL=ACC/DAT science world=GEN.F

uunchaaiiyoN par pahuNch-**aa** di**yaa**
heights.OBL on arrive-CAUS give.PFV.M.SG
'… his book written on the mysteries of the universe 'A brief history of time' brought him to the heights of the scientific world.' (Extract from news article [4]; *Live Hindustan*)

(303) … havaa=**ne** desh b^{h}ar meN b^{h}ayaN-kar tabaahii machaa-**ii**
wind.F=ERG country whole in tremendous devastation.F cause-PFV.F
'… the wind caused tremendous devastation in the whole country.' (Emille Hindi Corpus; ehinweb032)

(304) achaanak havaa meN uRte aae patt^{h}ar=**ne** kiyaa
unexpectedly wind in flying come stone.M=ERG do.PFV.M.SG

do kaaroN=ko damage
two car.PL.OBL=ACC damage.M
'Unexpectedly a stone that came flying in the wind made damage to two cars.' (Extract from news article; *Asia Metro News*)

[39] The perfective verb form and the past tense auxiliary *th-* 'be.PST' do not carry person specifications. It is only the present tense *ho-* 'be.PRS' auxiliary that can show person specifications, but note that in the ergative pattern agreement with an object can occur only in 3rd person. 1st and 2nd person object pronouns are marked as accusative and thus block agreement.

The ergative =*ne* surfaces only finite clauses. It is obligatorily realised on agents and causer agents in active voice clauses with transitive verbs carrying perfective morphology. There are, however, exceptions such as *laa-* 'bring'[40] with which =*ne* is ungrammatical, as well as *samajh-* 'understand' with which it is optional (see Mohanan (1994: 72), Davison (1999: 185) and Montaut (2004: 181)). Also, in some Hindi varieties =*ne* is realised optionally with intransitive verbs denoting body related functions. Davison (1999) provides a full list of such intransitive verbs, shown in (305):

(305) Optional [ERG] intransitives, Hindi-Urdu (Davison, 1999: 186-187)

bhauNk-	'bark', 'shout absurdly, howl'
jhaaNk-	'peep, look into/through' [meeN]
khaaNs-	'cough'
chiiNk-	'sneeze'
muskaraa-	'smile' (with or without cognate object)
thuuk-	'spit'
muut-	'urinate'
hag-	'defecate'.
nahaa-	'bathe (oneself)'
roo-	'cry'
haNs-	'laugh'
gaa-	'sing'
so-	'sleep'

As Davison clarifies, not all speakers use the ergative marker with these intransitives, and some of my consultants rejected the realisation of =*ne* in intransitive clauses altogether, while others accepted =*ne* with some but not all verbs in (305). The realisation of =*ne* with *so-* 'sleep', for

[40]Butt and Lahiri (2013) propose that *laa-* 'bring' might be a lexicalisation from a V-V complex predicate *le anaa* 'take come' which would explain why the ergative marker is ungrammatical with this verb: "it acts like an intransitive verb in terms of subject case assignment" (2013: 26). I propose to capture the ungrammaticality of =*ne* with intransitives such as 'come', 'go', 'sit' in terms of a requirement in the lexical entries of the verbs that they are parsed in the context of no fixed structure (Section 5.4). If *laa-* 'bring' is a lexicalisation from the combination of 'take' and 'come', the ungrammaticality of =*ne* can be captured along similar lines, i.e. as a retained requirement for realisation in the context of no fixed structure.

example, was indicated as ungrammatical. In previous work the optional realisation of *=ne* with body related functions is argued to lead to intentionality readings, for example coughing on purpose rather than coughing accidentally (see Section 5.3).

To generalise, the 'primary' function of the ergative marker *=ne* is to distinguish the external argument from the rest of the predication in transitive perfective clauses. It expresses an unambiguous relation between the argument it attaches to and the event denoted by the verb identifying the participant that has caused the event (or informally, is "responsible" for the event). Its use with intransitives is an extension of this primary function to achieve a pragmatic contrast between intentional and accidental occurrence with verbs that allow the re-interpretation.

The so-called unaccusative intransitives strictly do not allow *=ne*. These are change of state and change of location verbs such as *jaa-* 'go', *gir-* 'fall', *baith-* 'sit', *aa-* 'come', as indicated with the pairs in (306)-(308). However, the category of unaccusativity is not unproblematic. Ahmed (2010) shows that the distinction between unaccusatives and unergative verbs in Urdu/Hindi is not clear-cut as some intransitive verbs show hybrid behaviour which relates to the animacy of the subject.

(306) *jaa-* 'go' in the perfective:

(a) raam gayaa
Ram.M go.PFV.M.SG
'Ram went.'

(b) *raam=ne gayaa
Ram.M=ERG go.PFV.M.SG
'Ram went.'

(307) *gir-* 'fall' in the perfective:

(a) raam gir-aa
Ram.M fall-PFV.M.SG
'Ram fell.'

(b) *raam=ne gir-aa
Ram.M=ERG fall-PFV.M.SG
'Ram fell.'

(308) *bait^{h}-* 'sit' in the perfective:

(a) raam bait^{h}-aa
Ram.M sit-PFV.M.SG
'Ram sat.'

(b) *raam=ne bait^{h}-aa
Ram.M=ERG sit-PFV.M.SG
'Ram sat.'

The ungrammaticality of *=ne* with unaccusatives extends to complex predicate constructions, irrespective of the meaning and type of the main verb. Verbs such as *jaa-* 'go', *baith-* 'sit', *paR-* 'fall', *aa-* 'come' and *uTh-* 'wake' cannot be realised with an ergatively marked subject in both their main verb and light verb use. Comparing (309) and (310), the ergative marker cannot be realised in (309) on the subject *ye baag^{h}* 'these tigers' because of the complex predicate construction formed with the stem of the verb *khaa-* 'eat' followed by the inflected light verb *jaa-* 'go'. In contrast, *=ne* is obligatorily realised on the subject *piiTar* in (310) where we observe a single verb construction with *k^{h}aa-* 'eat' carrying the perfective morphology[41].

[41] Other differences between complex predicates formed by a sequence of two verbs (also often referred to as 'compound verbs') and single verb constructions are that the former disfavour negation, as well as forming questions and necessarily indicate reaching the natural endpoint of the event (Bashir, 1999), often said to correlate with telicity (Hook, 1974, 1991, 1993; Singh, 1998). These aspects of the complex predicate constructions will not be addressed here.

(309) is varsh bʰii chʰe janvarii=ko **ye** **baagʰ** tiin
this.OBL year also six January=KO these tiger.M three

gaayoN=ko maar-kar **kʰaa** **gaye**
cow.PL.OBL=KO hit/kill-CONJ eat go.PFV.M.PL

'This year also on the sixth of January these tigers killed and ate three cows.' (*lit.* 'having killed three cows, ate (them) up') (ehinweb147; Emille Hindi Corpus)

(310) **piiTar=ne** tiin mahiine tak daliyaa kʰaa-ne ke alaavaa
Peter.M=ERG three month until porridge.M eat-INF.OBL except

aur kuchʰ nahiiN **kʰaa-yaa**
and some NEG eat-PFV.M.SG

'For three months Peter ate nothing other than porridge.' (*lit.* 'except for eating porridge, did not eat anything else') (ehinweb1f5; Emille Hindi Corpus)

Light verbs retain not only sensitivity to the immediate linguistic context in which realised (obligatory unmarked subject) but also make an aspectual contribution towards event construal (perhaps carrying *aktionsart* information and/or some aspect of its main verb meaning).[42] Generally, there is consensus that one of the verbs, usually the first in the bare stem form, is the main contributor of lexical meaning, while the other – also referred to as a light verb or vector verb – carries TAM morphology and contributes additional information that relates to aspect (telicity) and other semantic notions such as volitionality, suddenness, benefaction, forcefulness, regret, affectedness (Abbi & Gopalakrishnan, 1991; Butt, 2010; Hook, 1974, 1991, 1993; Kachru, 2006; Poornima, 2012). For example, Kachru (2008) explains for the light verb *jaa-* 'go' that "with transitive verbs it expresses hurried, impulsive action" (2008: 96). She gives the example in (311) where the complex predicate (translated as "dashed off") is formed with the transitive verb *likh-* 'write' in root form followed by the perfective form of the light

[42] In Butt and Ramchand (2005) light verbs are analysed as instances of event modification where the light verb provides the process part of the event and the verbal stem provides the final state achieved; they describe light verbs as creating an accomplishment or achievement predicate.

verb *jaa*- 'go'. The reading Kachru describes perhaps has to do with an achievement reading brought by the use of *jaa*-.

(311) **vo** gusse=meN jaan-e kya kya **lik^{h}** **gayaa**
3SG anger=in know-SBJV what what write go.PFV.M.SG
'Who knows what he dashed off in anger.' (Kachru, 2006: 96; transcription and glosses are adapted)

Some main verb and light verb combinations allow reversal where both the lexical meaning and tense-aspect morphology are contributed by the verb that is realised last (for an account in terms of headedness, see Poornima, 2012; Poornima & Koenig, 2009). For example, in (312) we observe an ergatively marked subject with the verb *jaa*- 'go' in stem form followed by *bech*- 'sell' which carries perfective morphology. As we saw from examples above, *jaa*- is realised with unmarked subjects when acting as a light verb in final position. Here, the ergative marker is permitted because the final perfective verb is the transitive *bech*- 'sell'.

(312) raam=ne apnaa makaan **jaa** **bech-aa**
Ram.M=ERG self's house go sell-PFV.M.SG
'Ram sold his house.' (Hook, 1975 via Poornima 2012: 117; transcription and glosses are adapted)

Constructions such as (312) are less studied for the pragmatic effects that are achieved with their use. I will not explore light verbs any more than the discussion here as this would necessitate a detailed account of incremental event construal. My aim here is to highlight that the realisation of *=ne* is dependent on what verb carries the perfective morphology. This observation will take formal significance in Section 5.5 where it will be argued that transitive perfective verbs do not project a fully complete propositional template; they share the job with the ergative marker.

To conclude, we observe two strategies for the identification of the subject expression which combines with a predicate to establish a proposition. The subject is disambiguated either through case-marking early on in the derivation process in the perfective or at the finishing stages via verbal morphology in all other cases. The ergative marker *=ne* informs the parser well ahead of parsing the verb that the expression is the 'external' argument of a finite clause. Unmarked subjects, on the other hand, are associated with temporary structural underspecification which is resolved once the finite verb projects a propositional template. These claims become more explicit as I introduce the formal analysis in Section 5.4 but before that the question that remains is how to explain (and capture formally) the ungrammaticality of *=ne* with non-perfective verbs and verbs that describe a change in state or location and its obligatory realisation with most transitive perfective verbs. To address this question, I discuss the perfective verb form in a bit more detail in the following section.

5.2.2 The perfective verb form

The ergative pattern is observed when describing single occurrence past events, as exemplified in (313)-(315). The perfective verb form is formed with the verb stem followed by the endings *-ii*/*-iiN*/*-aa*/*-e* depending on gender and number. The use of perfective morphology on the verb leads to a simple past interpretation in (313). In combination with a tense-carrying auxiliary, it leads to a present or past perfect interpretation, as in (314) and (315), where both the perfective main verb and the auxiliary show agreement in gender and number with the unmarked object *rotii* 'bread'.

(313) raam=ne kitaab k^{h}arid-ii
Ram.M=ERG book.F buy-PFV.F
'Ram bought a book.'

(314) raam=ne rotii kʰaa-yii hai
Ram.M=ERG bread.F eat-PFV.F be.PRS.3SG
'Ram has eaten bread.'

(315) raam=ne rotii kʰaa-yii tʰ-ii
Ram.M=ERG bread.F eat-PFV.F be.PST-F
'Ram had eaten bread.'

In terms of the tense-aspect contribution of the perfective verb form, I hypothesise that it brings information about an event time prior to some reference time but does not specify what the reference time is. The *ho-* 'be' auxiliary in (314) and (315) brings information about the reference time but in (313) it is subject to contextual resolution. When no other input is made, it defaults to an event time prior to the utterance time (a simple past interpretation). However, I am not concerned with a representation of the precise temporal and aspectual organisation of a clause and incremental event construal will be left for future work.

Note that we do not observe person agreement in the ergative construction. Empirically, the present tense auxiliary *ho-* 'be' can carry person agreement, however, 1st and 2nd person pronoun objects are always marked as accusative, and thus block agreement. The perfective verb form shows agreement only in gender and number which reflects the historical origin of the ergative pattern from a Sanskrit adjectival participle construction or a past passive participle. Montaut (2017) explains that the past passive participle, or verbal adjective, was used as a predicate agreeing in gender and number with the patient (a type of a Sanskrit nominal sentence). With frequency of use, it grammaticalised into the standard for the expression of past. The historical origin of the ergative marker *=ne,* however, is subject to much debate (Verbeke & De Cuypere, 2009). Butt (2006) argues for a common locative origin of both the ergative and dative from the Sanskrit *janiye* 'for the sake of, because of' which gave rise to both goal and control readings. In Hindi-Urdu, however, the dative *=ko* predates the ergative

=*ne* and the latter was probably borrowed from neighbouring Haryanvi varieties in which the ergative and dative are homophonous and co-occur within the same clause (Butt & Ahmed, 2011; Phillips, 2014; Verbeke & De Cuypere, 2009). The ergative agreement pattern (agreement with the non-agent in transitive clauses), thus, predates the ergative =*ne* but it is currently not understood why the need to reinforce the pattern with the ergative marker arose.

Synchronically, in Hindi an identical verb form is observed in other constructions as well. These are illustrated below:

(316) unhoN=**ne** apnii pehlii **gazal** gyaarah
3PL.OBL=ERG self.F first.F ghazal.F eleven

saal=kii umra meN **lik^{h}-ii**
year=GEN.F age.F in write-PFV.F
'He wrote his first ghazal at the age of 11.' (Emille Spoken Hindi corpus; *ehinsp02e*)

(317) b^{h}aarat=ke alag-alag pradeshoN meN
India-GEN.M.OBL different-different state.M.OBL in

alag-alag **b^{h}aashaaeN** **bol-ii - lik^{h}-ii** jaa-tii haiN
different-different language.F.PL speak-PFV.F - write-PFV.F PASS-HAB.F be.PRS.PL
'In the different states of India different languages are spoken and written.' (Emille Hindi Webnews corpus; *ehinweb084*)

(318) … yeh pehlaa maukaa hai jabki bachchoN ke liye
this first.M occasion be.PRS.3SG when child.PL.OBL for

lik^{h}-ii kitaab=ko yeh puraskaar mil-aa hai
write-PFV.F book.F=DAT this award.M receive-PFV.M.SG be.PRS.3SG
'… this is the first time when a book written for children has received this award.' (Emille Hindi Webnews corpus; *ehinweb1ee*)

(316) illustrates the ergative agreement pattern with a =*ne* marked agent and the verb *likh*- 'write' in the perfective showing agreement with the feminine noun *kitaab* 'book'. In (317) the same verb form surfaces in a passive construction formed with the passive auxiliary *jaa*- 'go'. Agreement is with the feminine logical object *bhaashaaeN* 'languages'. In (318) the same

surface verb form is realised in a prenominal modifying structure with a stative reading. The perfective verb form *likhii* shows agreement with the feminine *kitaab.* In all three constructions the transitive perfective verb form shows agreement with a non-agent argument.

Properties of perfective prenominal modifying structures are somewhat reminiscent of the ergative pattern. According to Kachru (2006), these are participle forms that function as modifiers and signal "a state resulting from the action of the verb" (2006: 229). Transitive perfective participles cannot modify an agent, as evident from the comparison of (319) and (320), unlike imperfective participles as shown in (321).

(319) laRkii-kii paR^{h}-ii (huii) kitaab
girl-GEN.F read-PFV.F be.PFV.F book.F
'the book read by the girl.'

(320) *kitaab paR^{h}-ii (huii) laRkii
book.F read-PFV.F be.PFV.F girl.F
'the girl who read a/the book'

(321) kitaab paR^{h}-t-ii (huii) laRkii
book.F read-IMPF-F be.PFV.F girl.F
'the girl reading the book'

Based on these observations, I conclude that the perfective transitive verb form, irrespective of the type of construction in which it is realised, targets a (logical) object argument. I assume that it projects some minimal structure with only an 'internal' argument and the 'external' argument has to be introduced in some other way. This is where the ergative marker *=ne* comes to the rescue; it identifies an agent argument of a finite clause and thus builds a partial predicate-argument structure ahead of parsing the verb. The ungrammaticality of *=ne* with unaccusative verbs stems exactly from its constructive role. Unaccusative verbs

cannot be parsed in the context of already built structure. Before I proceed to a formulisation of the claims made, I discuss in brief the accusative/dative marker *=ko*.

5.2.3 The *=ko* marker

The *=ko* marker performs a multitude of functions which are a challenge to capture under a single lexical entry. It attaches to direct objects as in (322) where it is realised with the specific object *patT^{h}ar* 'stone' (the use of *=ko* with direct objects was discussed extensively in Chapter 4 and will not be discussed here again). In addition, *=ko* is obligatorily realised with recipients of ditransitive constructions (323), as well as on experiencers (324) and with unaccusative transitives (325) (the so-called 'dative subjects'; however, see Montaut (2003) who doubts the usefulness of the category of subject for the analysis of 'non-canonical subjects' in Indo-Aryan languages).

(322) (a) aaNgan=meN aa-kar us=ne ek D^{h}elaa uT^{h}aa-yaa
courtyard=in come-CONJ 3SG.OBL=ERG one lump.M lift-PFV.M
'Coming to the courtyard, he picked up a lump.'

(b) vah buR^{h}iyaa=se bol-aa ki maiN is patT^{h}ar=**ko**
3SG old.lady=from say-PFV.M COMP 1SG 3SG.PROX.OBL stone=ACC

pakaa-kar k^{h}aa-uuNgaa
cook- CONJ eat-FUT.M.1SG
'He told the old lady, I will cook and eat this stone.' (extract from *Kanjuus buR^{h}iyaa aur sipaahii*)

(323) siitaa=ne raam=**ko** kitaab dii
Sita.F=ERG Ram.M=DAT book.F give.PFV.F
'Sita gave a/the book to Ram.' (elicited)

(324) raam=**ko** gussa aa-yaa
Ram.M=DAT anger.M come-PFV.M
'Ram got angry (Lit. 'Anger came to Ram.').' (elicited)

(325) raam=**ko** ye kʰabar mil-ii ki …
Ram.M=DAT 3.PROX news.F meet-PFV.F COMP
'Ram got the news that …' (elicited)

Further uses include modal constructions with an infinitive form of the verb (326), as well as temporal uses with verbal infinitives (327), among other adjunct uses such as days of the week and times of the day (328) (for a more detailed overview see Ahmed, 2006), showing no clear one-to-one mapping between the marker and any grammatical function or semantic role:

(326) raam=**ko** skuul jaa-naa hai
Ram.M=DAT school go-INF be.PRS.3SG
'Ram has to go to school.' (elicited)

(327) raam chaaval bana-ne=**ko** hai
Ram.M rice.M make-INF.OBL=KO be.PRS.3SG
'Ram is about to make rice.' (elicited)

(328) prad^{h}aanmaNtrii=ne yeh film maNgalvaar=kii raat=**ko** dek^{h}-ii
prime minister=ERG 3.PROX film.F Tuesday=GEN.F night.F=KO see-PFV.F
'The prime minister saw this film on Tuesday night.' (Emille Hindi Webnews Corpus; *ehinweb10f*)

The multiple functions of *=ko* are a challenge to capture under a single lexical entry. Ahmed (2006) proposes that *=ko* has a core locative meaning that has extended to mark endpoint in temporal, mental (experiencers are locations) and eventual domains. Prototypical recipients are the endpoint of a transfer event; they receive a physical object. Metaphorically, experiencers are receivers of an experience, they can be understood as mental locations for experiences. By extension, the accusative use of *=ko* have to do with marking the endpoint or goal of an action, i.e. the argument towards which an action is directed. As Ahmed (2006) notes, it is not immediately obvious how to subsume all uses of *=ko* in terms of endpoint semantics, leaving some uses unexplained. His argument, however, is convincing and allows an analysis of *=ko* as expressing an underspecified relation between the marked expression and

the described event. In essence, an event modification of sorts, which is resolved contextually with respect to the immediate linguistic context and the type of expression it is marking.

The immediate question that arises is whether to differentiate between different uses of *=ko.* It is possible to assume a disjunctive lexical entry for *=ko* in which different lexical actions are projected depending on the context in which *=ko* is parsed (for example, when attaching to a day of the week versus a proper name). However, I will leave non-argument uses of *=ko* to the side. For argument uses, I will generalise that *=ko* marks a non-agent, i.e. a participant of the event that is not its initiator but is at the receiving end of an action, be it the recipient of an object or abstract entity (e.g. recipient of news), the affected argument towards whom an agent's actions are directed (patient) or being struck by a physical sensation (experiencer). Most previous work (if not all) differentiates between 'dative' and 'accusative' uses of *=ko,* treating these as homophonous forms, each associated with distinct grammatical functions and semantic roles. This is, however, problematic for a parsing-based framework as at the time of parsing a *=ko* marked proper name, as in (323), it is not clear whether it will 'end up' being the patient of a transitive clause or the recipient of a ditransitive clause. Thus, I assume a single lexical entry for both dative and accusative *=ko*; the precise semantic role of the *=ko* marked expression in the event is resolved once the verb has projected information about the type of event described.

In what follows, I discuss *=ko* in comparison with *=ne* and draw some similarities between the two markers, arguing that both perform a completive function on the NP level.

5.2.4 Structural similarities between *=ne* and *=ko*

The dative uses of *=ko* marker are often discussed in opposition with *=ne* (Butt, 2006; Butt, Grimm, & Ahmed, 2006) as both attach to NPs which show subject properties but are

associated with different semantic roles. In (329)-(330) and (331)-(332) the initial ergative and dative NPs are standardly analysed as the subject of the clause, following tests proposed by Mohanan (1994), such as control of participial adjuncts, gapping in coordination, acting as antecedents for the possessive *apnaa* 'self's' reflexive, obviating pronominal reference.

(329) pranav=**ko** mohan=kii yaad **aa-yii** / *aa-yaa
Pranav.M=DAT Mohan.M=GEN.F memory.F come-PFV.F come-PFV.M.SG
'Pranav remembered Mohan.' (*Lit.* 'The memory of Mohan came to Pranav.') (elicited)

(330) pranav=**ne** mohan=ko yaad **ki-yaa** / *k-ii
Pranav.M-ERG Mohan.M=ACC memory.F do-PFV.M.SG do-PFV.F
'Pranav remembered Mohan.' (elicited)

(331) tushaar=**ko** chaand **dik^{h}-aa**
Tushar.M=DAT moon.M appear-PFV.M
'Tushar saw the moon.' (*Lit.* 'The moon appeared to Tushar.') (Mohanan, 1994: 141)

(332) tushaar=**ne** chaand **dek^{h}-aa**
Tushar.M=ERG moon.M see -PFV.M
'Tushar saw the moon.' (Mohanan, 1994: 141)

What the pairs in (329)-(330) and (331)-(332) show is that *=ko* and *=ne* marked subjects surface with different verbs. Subjects that carry the *=ko* marker are realised with the so-called unaccusative verbs such as *aa-* 'come' in (329) which shows agreement with the noun *yaad* 'memory'. In (330) *=ne* is realised with the verb *kar-* 'do' which shows default agreement, indicating that *yaad kar-* is treated as a compound for 'to remember'. Unaccusative verbs obligatorily show agreement with an unmarked nominal. For example, throughout different constructions the intransitive verb *aa-* 'come' shows agreement with an unmarked common noun or proper name whether acting as a main verb (333) or is part of an N-V sequence (334) or a V-V sequence (335) (the nominal with which agreement is coreferential is in **bold**). Such verbs need to be parsed in the context of an unmarked nominal with which they show

agreement, unlike transitive verbs which in the perfective need not show agreement with any argument.

(333) **miiraa** g^{h}ar aa-**yii**
Mira.F home.M come-PFV.F
'Mira came home.'

(334) miiraa=ko **niind** aa-**yii**
Mira.F=DAT sleep.F come-PFV.F
'Mira got sleepy.'

(335) … **saare** **paud^{h}e** suuk^{h} aa-**yee** haiN
all plant.PL dry come-PFV.PL be.PRS.PL
'… all the plants have dried.' (Poornima, 2012, p. 241; adapted)

The ergative *=ne* and accusative *=ko* show similarities in terms of their structural contribution as both involve the 'blocking' of agreement in the perfective. This is illustrated in (336)-(337) where the perfective verb agrees in gender and number with *rotii* 'bread' in (336), but defaults to third person masculine singular in (337) where the case-marked names *priti* and *miiraa* are both feminine. In the case of a ditransitive verb, as in (338), the verb shows agreement with the unmarked theme *kitaab* 'book'.

(336) raam=ne **rotii** khaa-**yii** **hai**
raam.M=ERG bread.F eat-PFV.F be.PRS.3SG
'Ram has eaten bread.'

(337) priti=ne miiraa=ko maar-**aa** **hai**
Priti.F=ERG Mira.F=ACC hit-PFV.M.SG be.PRS.3SG
'Priti has hit Mira.'

(338) raam=ne pranav=ko **kitaab** d**ii**
Ram.M=ERG Pranav.M=DAT book.F give.PFV.F
'Ram gave a/the book to Pranav.'

The two case markers show further similarities: both *=ne* and *=ko* restrict possibilities for postponing modifying structure such as adjectives and genitive modifiers to the right of a case-marked head. This is illustrated in (339) where *kitaab* 'book' can precede the genitive modifier *miraa=kii* only if the marker *=ko* is not realised. In contrast, (340) shows that the object *kitaab* can carry *=ko* if it follows the genitive modifier. If we assume that the markers perform a 'completive' function, i.e. a boundary-indicating role (end of NP; as argued in Chapter 4), this finds an easy explanation. The marker acts as an unambiguous clue that all information necessary for the interpretation of the NP has already been made available and triggers the compilation of the NP. The ungrammaticality of *=ko* in (339) then has to do with the inability to 'revisit' an already established part of interpretation.

(339) kitab(*=ko) miiraa=kii main=ne paR^{h}-aa
book.F=ACC Mira.F=GEN.F 1SG=ERG read-PFV.M
'I read Mira's book.' (elicited)

(340) miiraa=kii kitaab=ko main=ne paR^{h}-aa
Mira.F=GEN.F book.F=ACC 1SG=ERG read-PFV.M
'I read Mira's book.' (elicited)

Also, both *=ne* and *=ko* attach to the end of a conjoined NP rather than on each noun, further highlighting their 'completive' function.[43] (341) and (341) show a conjoined NP carrying *=ne* and *=ko*, respectively. Each of the coordinated nouns carry oblique morphology[44] and the *=ne* and *=ko* markers surface at the end of the NP.

[43] Spencer (2005) argues that the case markers are to be analysed as non-projecting clitic postpositions rather than realisation of case. For the closely related Urdu, Butt and King (2004) argue that case takes scope over coordinated NPs and treat the markers as clitics.
[44] Oblique morphology is realised when a noun is followed by a case marker or postposition.

(341) … patrakaaroN aur ch^{h}aayaakaaroN=**ne** unheN g^{h}er liyaa
journalist.PL.OBL and cameraman.PL.OBL=ERG 3PL.ACC surround take.PFV.M.SG
'… journalists and cameramen surrounded them.' (Emille Hindi Webnews corpus; *ehinweb023*)

(342) … aur ab ve kebal opareTaroN aur darshakoN=**ko**
and now 3PL cable operator.PL.OBL and viewer.PL.OBL=ACC

blaikmel kar rah-e haiN
blackmail do PROG-PL be.PRS.PL
'… and now they are blackmailing cable operators and viewers.' (Emille Hindi Webnews corpus; *ehinweb03b*)

In summary, the ergative *=ne* and the accusative/dative *=ko* marker show structural similarities. Both markers are realised at the end of a conjoined NP and restrict possibilities for postponing modifying structure suggesting they perform an NP-boundary indicating role. However, while *=ne* unambiguously identifies an agent argument of a single occurrence event in the past, *=ko* surfaces in a wider range of constructions and defines only loosely how the non-agent argument it attaches to is related to the described event. In what follows I turn to a brief overview of previous work on case marking in Hindi and closely related Urdu.

5.3 Previous work on Hindi/Urdu

5.3.1 Case markers: *=ne* and *=ko*

Some theoretical approaches concentrate on the lexical semantics of case for the explanation of the distributional patterns of the ergative marker (Butt & King, 1991, 2003, 2004), others argue that verbs lexically stipulate for an ergative subject treating *=ne* as structural case (Davison, 1999). Mohanan (1990, 1994) analyses *=ne* as semantically determined: ergative case requires that the argument is associated with the semantic property CONSCIOUS CHOICE and does not have to do with transitivity. However, as she notes, the proposal is not unproblematic

as not all cases of an ergative argument are necessarily associated with deliberateness. Furthermore, Mohanan (1990, 1994) treats as lexical exceptions to the generalisation verbs that do not take the ergative but can be associated with deliberateness, for example *laa-* 'bring'. A further problem for a CONSCIOUS CHOICE explanation of the distribution of *=ne* is that inanimate ergative arguments are also possible, including natural forces (see Section 5.2.1) but also entities that cannot be easily ascribed conscious choice such as, for example, films in (343) or stones in (344) (repeated from (304)):

(343) is film=ne sab^{h}ii=ko mohit kar liyaa
3SG.PROX.OBL film.F=ERG all.EMPH=ACC fascinated do take.PFV.M.SG
'This film captivated everyone.' (Emille Hindi Webnews corpus; *ehinweb301*)

(344) achaanak havaa meN uRte aae patt^{h}ar=**ne** kiyaa
unexpectedly wind in flying come stone.M=ERG do.PFV.M.SG

do kaaroN=ko damage
two car.PL.OBL=ACC damage.M
'Unexpectedly a stone that came flying in the wind made damage to two cars.' (Extract from news article; *Asia Metro News*)

In later work, Butt and King (2004) propose a disjunctive lexical entry for *=ne* within LFG which gives the marker a 'constructive' role (Nordlinger, 1998). The lexical entry specifies that the marker attaches only to subjects and contributes extra semantic information when not structurally required. Butt and King discuss two contexts in which *=ne* is not structurally required and indicates that the subject has internal control over the action. These are intransitive clauses with verbs that describe bodily functions and infinitival modal constructions. An infinitival modal construction is illustrated in (345); the ergative marker is realised with an infinitive form of the lexical verb followed by the auxiliary *ho-* be' for the expression of modal meanings in direct alternation with the dative *=ko*, resulting in desire vs. necessity readings (see Butt & King, 2004 for details).

(345) aap=ne kya k^{h}aa-naa hai
2PL=ERG what eat-INF.M be.PRS.3SG
'What do you want to eat/what will you eat?' (spontaneous speech)

Bashir (1999) notes that the construction seems to be widely spread in the Urdu of Lahore but it is also attested in the Hindi of Delhi. The example in (345) is from a naturally occurring exchange in a shop in north Delhi between the owners. The construction was cross-checked with native speakers of Hindi; interestingly, my consultants who had moved to Delhi for studies or work made a note that the construction can be heard in Delhi but in other Hindi-speaking areas the use of the dative *=ko* would be preferred. The use of *=ne* in infinitive constructions seems confined to Delhi Hindi, said to be due to language contact with neighbouring Haryanvi varieties in which the ergative and dative markers are homophonous (Butt, 2006; Phillips, 2014).

The dominating view in the literature is that the use of *=ne* with intransitives encodes/entails some semantic property that is intrinsic to agents. In previous work the optional realisation of *=ne* with intransitives is said to correlate with volitionality, control over the action, responsibility for the initiation of the action, identifying strong agents, conscious choice or counter to expectation readings (Butt, 2017; Butt et al., 2006; Butt & King, 1991, 2003, 2004; de Hoop & Narasimhan, 2005; Mohanan, 1994; Poornima, 2012). The pairs in (346) and (347) show that when *=ne* is present this leads to a reading in which the action is done on purpose, as explained in Butt (2006, 2017) and Butt and King (1991, 2003). The verb shows 'default' agreement when *siitaa* carries the ergative marker.

(346) Optional *=ne* with *k^{h}aaNs-* 'cough'

(a) siitaa k^{h}aans-ii
Sita.F cough-PFV.F
'Sita coughed'

(b) siitaa=ne khaans-aa
Sita.F=ERG cough-PFV.M.SG
'Sita coughed (intentionally).'

(347) Optional =*ne* with *chik*^{h}- 'scream'

(a) siitaa chik^{h}-ii
Sita.F scream-PFV.F
'Sita screamed.'

(348) siitaa=ne chik^{h}-aa
Sita.F=ERG scream-PFV.M.SG
'Sita screamed (intentionally).

As per Butt and King's analysis, it is the case marker that expresses the semantic difference in both intransitive clauses and infinitival constructions. The lexical entry they propose, in (349), controls that extra semantic contribution is made only in the absence of an object. In the presence of an object, i.e. with transitive verbs, =*ne* is structurally required.

(349) LFG lexical entry for =*ne* as per Butt and King (2004)

(↑CASE) = ERG
(SUBJ↑)
[(↑SEM-PROP CONTROL) = INT
∨
((SUBJ↑) OBJ)
((SUBJ↑) VFORM) = PERF]

The entry requires a subject ((SUBJ↑)) which is either assigned the semantic property of internal control ((↑SEM-PROP CONTROL) = INT) or, in the presence of an object ((SUBJ↑) OBJ)) and when the verb form is perfect, leaving the subject semantically unmarked. Butt and King's (2004) approach, thus, captures the fact that we observe =*ne* with inanimates in transitive clauses as the ergative is structurally required and its realisation does not depend on any agency-related property. In contrast, in intransitives the realisation of =*ne* is much more restricted and seems

to be confined to arguments that can act as agents. I have not come across any examples of an inanimate ergative subject of an intransitive clause.

Ahmed (2010) extends the lexical entry proposed by Butt and King to capture the fact that we observe the optionality of *=ne* with only a certain set of intransitive verbs. He posits that the lexical entries of a special class of verbs – the class of bodily function verbs – contain information that they belong to this class of verbs ((↑SEM-PROP VERB-CLASS) = bodily function). The lexical entry of the ergative marker *=ne* is extended to contain a constraining equation ((↑SEM-PROP VERB-CLASS) =c bodily function)[45] which restricts the realisation of *=ne* with intransitives only of this class, and – as per Butt and King – gives rise to internal control readings. In other words, *=ne* brings this constraint and the value is provided by the verb; if *=ne* is realised with a verb that does not bring the value BODILY-FUNCTION for the VERB-CLASS feature, this results in ungrammaticality. Ahmed's analysis, thus, captures the distribution of *=ne* in intransitive clauses in terms of a compatibility between the semantics encoded by *=ne* and the intransitive verb belonging to a special class. However, the problem with this approach is that it relies on a predetermined set of verbs along a very loosely defined verb class feature of bodily functions.

Poornima (2012) provides a different perspective on what drives the optional realisation of *=ne,* although it is not the focus of her thesis and is not explored in detail. Based on examples (350) and (351) she argues that the realisation of the ergative marker has to do with indicating an action that is counter to expectation when it comes to the subject's referent.

[45] The =c symbol

(350) court mein bahut log moujuud t^h-e p^hir b^hii kiisii par
court in many people present be.PST-PL still any on

b^hii kuute=**ne** b^hauuNk-aa tak nahiiN
also dog.M=ERG bark-PFV.M even NEG
'Many people were present in court but still the dog did not even bark at anyone.' (Poornima 2012: 30; adapted)

(351) tansen=**ne** bas gungunaa-yaa aur barish shuru ho gayii
Tansen.M=ERG just hum-PFV.M and rain start be go.PFV.F
'Tansen just hummed and it started raining.' (Poornima 2012: 30; adapted)

In (350) it is unusual for the dog not to bark in a court full of people (i.e. counter to expected behaviour), and in (351) – *Tansen* brings rain with just his humming (Tansen is a 16th century singer who is known from legends to bring rain with his singing). It is not entirely clear, however, how example (351) relates to the notion of counter-to-expectation. My understanding is, rather, that in this example the attention of the hearer is drawn to the fact that *Tansen* brought the rain (even) with just humming as opposed to singing. Similarly, in (350) we observe emphasis on the negation. Poornima explains that the ergative marker makes a semantic contribution of counter-expectation but also the conversational background has to support such a reading.

When it comes to the *=ko* marker, Butt and King (2004) propose the disjunctive lexical entry in (352) to capture its use as an accusative marker ((OBJ↑)) which marks specificity ((↑SEM-PROP SPECIFIC) = +) and its use as a dative marker attaching to goals ($(OBJ_{go}↑)$) and experiencer subjects ($(SUBJ_{exp}↑)$).

(352) LFG lexical entry for =*ko* Butt and King (2004)

[(↑CASE) = ACC
(OBJ↑)
(↑SEM-PROP SPECIFIC) = +
∨
(↑CASE) = DAT
(OBJ$_{go}$↑) ∨ (SUBJ$_{exp}$↑)
(↑SEM-PROP CONTROL)]

Butt and King (2004) treat deviations from these patterns as cases of *quirky* case. The example they give is the verb *laa-* 'bring' which as a transitive verb is expected to be realised with the ergative marker =*ne* in the perfective. However, this is not the case and *laa-* is strictly realised with no overt case marker, as shown in (353). The absence of an overt marker Butt and King (2004) analyse as nominative case (for consistency throughout this thesis I do not gloss unmarked NP as nominative).

(353) nadya kitaab laa-yii
Nadya.F book.F bring-PFV.F
'Nadya brought a book.' (Butt and King, 2004; glossing adapted)

Instances of quirky case are captured within the verb's lexical entry. For *laa-* the following lexical entry is defined:

(354) LFG lexical entry for *laa-* (Butt and King, 2004)

(↑PRED)= < ag[-o] th[-r] >
(↑SUBJ CASE) = NOM

The lexical entry of *laa-* specifies that the predicate's arguments are related to grammatical functions by mapping principles (however, these are not discussed in detail). The lexically stipulated features [±r(estricted)] and/or [±o(bjective)] and Mapping Theory identify core grammatical relations.

5.3.2 Interim summary and type of analysis pursued

The approach adopted here differs significantly from previous work on Hindi in that it seeks to provide (morpho-)syntactic explanations in terms of the dynamics of interpretation build-up in context. As discussed in Chapters 3 and 4, this process is formally represented as gradually expanding semantic tree structures as each word is parsed in context until a completed tree is derived showing how expressions combine to yield a proposition. It proposes that case markers in Hindi provide procedural information, i.e. information on how the case-marked expression is to be interpreted in the unfolding propositional structure.

NPs with no overt case markers are traditionally analysed or referred to as nominative in the literature on Hindi (Bhatt, 2005; Butt & King, 2004; Davison, 2007; Mohanan, 1994; Narasimhan, 1998). Here, null marking is treated as the absence of case and thus the absence of any specifications regarding the argument role of the NP. Such NPs are described throughout this thesis as unmarked and are associated with structural uncertainty at the time of parsing which can be (at least partially) resolved with the parse of the finite inflected verb.

I depart from the idea that verbs directly lexically select case (Davison, 1999) and argue for an analysis in which case provides information to do with how the marked expression fits within the event predication, ahead of parsing the verb. While the ergative =*ne* identifies the participant that *causes* or *initiates* some event (informally, the participant 'responsible' for the event), the accusative/dative =*ko* expresses a much looser relation between the participant and the event which is specified as the parse progresses and more information becomes available (with different factors playing a role, such as the meaning of the nominal to which it is attached, the presence of other NPs in the clause and structural and semantic content projected by the verb). This allows capturing the diverse functions of =*ko* without positing homophonous forms associated with different semantic roles and grammatical functions.

Building up on previous work, as well as the discussion presented in Section 5.2, the line of thought I follow here is that agency-related meanings such as volitionality and control over an action, associated with the use of the ergative marker in intransitive contexts are perhaps best treated as pragmatically arising effects of the extension of its 'primary' function in some Hindi/Urdu varieties (see Cann & Miljan, 2012 for an analysis of case alternations in terms of pragmatic inference over the grammatical system), its 'primary' function being to distinguish the external argument from the predication. The use of *=ne* in an intransitive clause draws the hearer's attention to the event predication inviting for an interpretation of the predicate in the context of an 'agentive' argument but also with respect to the discourse context. In this way volitional, purposeful, control or more generally 'increased' agency readings, and even counter to expectation readings in the sense of an unusual result and/or action, are treated as pragmatic effects. This approach is in line with Butt and King's (2004) argument that *=ne* shows both a structural and semantic role expressing subtle semantic differences in interpretation but argues for deriving these meanings pragmatically, rather than encoding semantic properties directly.

Thus, similarly to Butt and King (2004), the Dynamic Syntax analysis that will be proposed in Section 5.4, argues that case markers project information independently of verbs. However, it aims to express case markers' contribution in dynamic terms as providing clues, ahead of parsing the verb, for how the marked expression is to be interpreted within the unfolding propositional structure. It does also share insights with approaches which stipulate that case assignment relates to properties of the verb (reminiscent also of Butt and King's approach to quirky case). However, this is expressed in terms of requirements in the lexical entry of the finite verb for the type of linguistic context in which it can be parsed, rather than directly assigning case. With case projecting semantic and/or structural content, a verb's lexical

entry can be modelled in such a way that it is compatible or incompatible with a case-markers contribution within a single propositional domain.

A further difference with previous work is that grammatical functions are not part of the formal analysis, neither are case labels such as ergative, accusative and dative, although I do use these for clarity of discussion. Roughly, in the DS model the notion of logical object translates as the expression that combines with the verb to yield a predicate. The logical subject is, then, the expression which combines with a completed predicate type to establish a proposition. Case marking provides information on how the marked expression fits within the unfolding propositional structure.

Underspecification and incrementality are key concepts allowing any aspect of meaning to remain underspecified until more information has become available. Importantly, once some semantic content is established it cannot be erased from the tree structure or be changed, if this requires undoing previous parsing actions (Cann et al., 2005; Marten, 2002). In other words, while instructions from the lexicon give information on how to advance the parse, a parsed expression may remain underspecified with respect to its type (*Ty*), its formula value (*Fo*), and/or tree node address (*Tn*) at the time of parsing. Importantly, once a value is updated in the derivation process and is thus 'completed' (whether in terms of a *Fo*, *Ty* and/or *Tn* value), it cannot be undone. These principles are applied to Hindi clause structure to account for the 'completive' function of case markers on the NP level.

In the remainder of this chapter I elaborate on these claims proposing lexical entries for the *=ne* and *=ko* markers and the contribution of verbs, using the formal tools of Dynamic Syntax.

5.4 Formal modelling: the dynamics of structure building

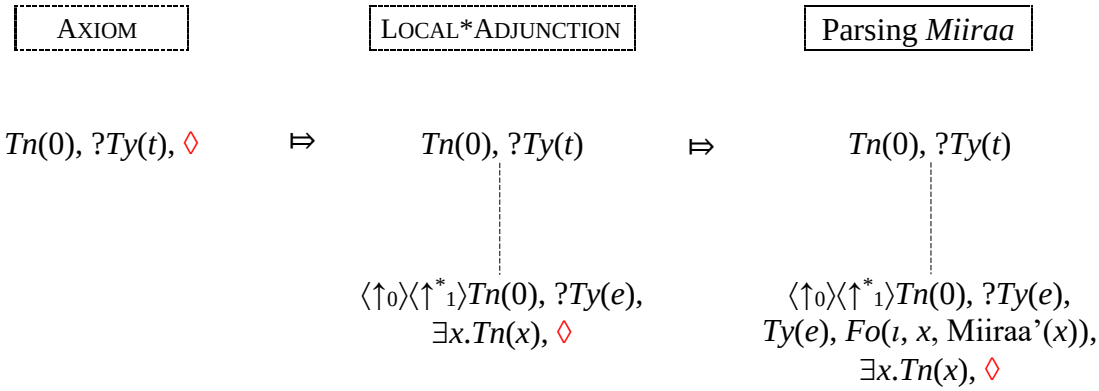
5.4.1 Subject-verb agreement in non-perfective contexts

In DS the interpretation process is not exclusively lexicon-driven, and the building of structure involves a combination of lexical and computational actions. As already discussed in Chapter 4, multiple strategies are available for the parse of an initial argument for a string such as (355). The rule for building a LINKed structure, as well as the rules of LOCAL *ADJUNCTION and *ADJUNCTION are all available at the onset of a parse.

(355) miiraa aa-egii
Mira.F come-FUT.F
'Mira will come.'

Here, I will concentrate on strictly local structure building as if (355) is uttered out-of-the-blue with no parts of it previously presupposed (i.e. in an idealised zero context). Starting from the axiom to establish a proposition ?*Ty*(*t*), the rule of LOCAL *ADJUNCTION builds a structurally underspecified node decorated with the following notations: ?*Ty*(*e*), $\langle\uparrow_0\rangle\langle\uparrow^*_1\rangle Tn(0)$ and $\exists x.Tn(x)$, as illustrated in (356). The ?*Ty*(*e*) requirement states that the node needs to be decorated with an expression of type *e.* The notation $\langle\uparrow_0\rangle\langle\uparrow^*_1\rangle Tn(0)$ specifies that the node needs to find such a tree node address that 'up' an argument relation and 'up' an unspecified number of functor relations (zero or more) it finds the top node *Tn*(0), i.e. it needs to find a tree node address within the local propositional domain. The decoration $\exists x.Tn(x)$ requires that the tree node eventually finds a tree node address. The effect of the rule of LOCAL *ADJUNCTION leaves the pointer at the unfixed node, ready for the parse of *Miiraa.*

(356) Parsing *Miiraa aaegii*



Next, THINNING and COMPLETION apply and move the pointer to the top node. Continuing with the parse of (355), the next step in the derivation is the parse of the future verb *aaegii*. The future verb projects a predicate-argument structure but also constructs an event term which it decorates with information about the temporal and aspectual organisation of the event. The lexical entry in (357) is proposed.

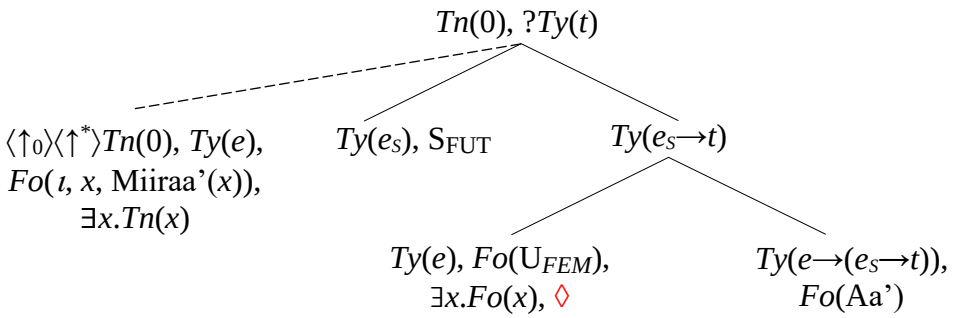
(357) Lexical entry for *aaegii*

aaegii	IF	?*Ty*(*t*), *Tn*(*n*), ⟨↓0⟩⊥	(i)
	THEN	make(⟨↓0⟩), go(⟨↓0⟩),	(ii)
		put(*Ty*(e_S), S_{FUT}), go(⟨↑0⟩),	(iii)
		make(⟨↓1⟩), go(⟨↓1⟩), put(*Ty*(e_S→*t*)),	(iv)
		make(⟨↓1⟩), go(⟨↓1⟩),	(v)
		put(*Ty*(*e*→(e_S→*t*)), *Fo*(aa')),	(vi)
		go(⟨↑1⟩); make(⟨↓0⟩), go(⟨↓0⟩),	(vii)
		put(*Ty*(*e*), *Fo*(U_{FEM}))	(viii)
	ELSE	Abort	(ix)

The first IF statement (line (i) of the lexical entry) states that if the pointer is at a type-*t*-requiring node at some root node *Tn*(*n*) and there is no fixed event node below ⟨↓0⟩⊥, the parse

can proceed, otherwise it is aborted (ix). Then, the pointer builds an argument event node and decorates it with the metavariable S_{FUT} before returning to the root node (ii-iii). This is a very sketchy way to represent the parse of temporal information; for a more thorough discussion on the incremental construal of the event node and the representation of tense and aspect information, see Cann (2011). Then, the pointer builds an event predicate node $e_S \rightarrow t$ and goes there (iv). From there, it builds a functor node of type $e \rightarrow (e_S \rightarrow t)$ for a one-place predicate and decorates it with a *Fo* value (vi). The pointer returns to the event predicate node and builds an argument node which it decorates with a restricted metavariable U_{FEM} projected by agreement morphology, as well as the requirement $\exists x.Fo(x)$ which states that the node needs to find a contentful *Fo* value (viii). This completes the parse leaving the pointer at the 'subject' node. The resulting structure from running the actions as per the lexical entry of *aaegii* is given in (358) (person and number agreement are ignored here):

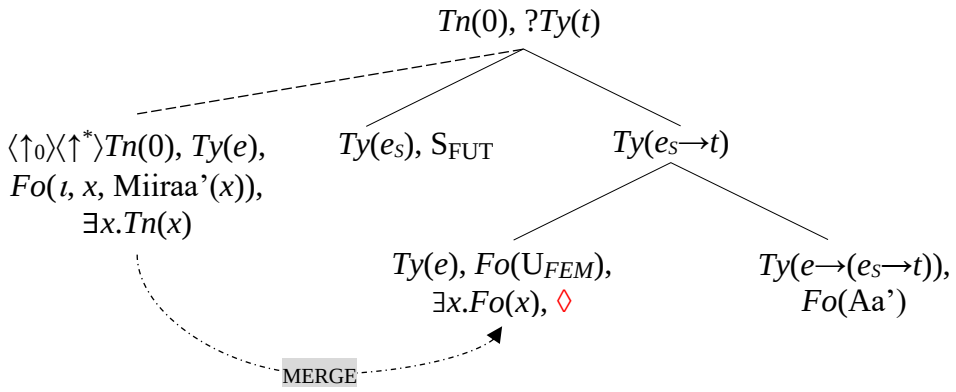
(358) Parsing *aaegii*



The requirement that the future verb is parsed in the context of no fixed event node is an important one as this captures the ungrammaticality of the ergative marker with non-perfective verb forms. As we will see in Section 5.5, I propose that the ergative marker builds an event node and fixes the 'subject' ahead of parsing the verb.

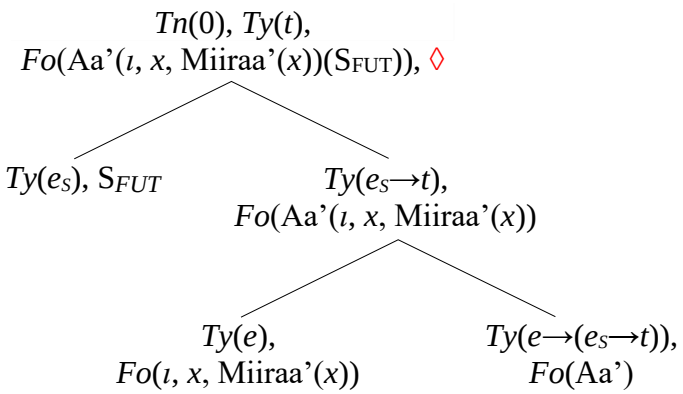
The lexical entry in (357) shows that agreement morphology in Hindi projects a restricted metavariable much like pronouns. Unlike pronouns, however, metavariables projected by agreement morphology can find a value from the context via SUBSTITUTION or within the construction process itself via MERGE. Pronouns come with a bottom restriction ([↓]⊥ for 'below the falsum holds') which means that a value is to be found 'outside' of the unfolding propositional structure. In (358), the only possible candidate to provide a contentful formula for the 'subject' node is the unfixed node. Formula and type values are compatible, and the two nodes can unify via MERGE, as illustrated in (359).

(359) Application of MERGE



Following the standard THINNING, COMPLETION and ELIMINATION rules the pointer moves upwards, accumulating semantic content along the way to establish the fully completed propositional structure in (360).

(360) Complete parse for *miiraa aaegii*



For a head-final language like Hindi the parse of temporal information signals a propositional boundary and acts as a trigger for the accumulation of information at the root node. This means that all information for the interpretation of the local predicate is provided and the 'completed' predicate combines with the subject via FUNCTIONAL APPLICATION (see Section 3.4.2.5) to yield a completed event predicate node. A morphosyntactic reflexion of this process in Hindi is the parse of subject agreement morphology at the finishing stages of the derivation which ensures that the right value is found for the 'subject' node. Following the bottom-up fashion in which semantic information combines to yield a proposition, the finite verb provides the necessary information for the subject to combine with a completed predicate and be interpreted against the temporal and aspectual organisation of the event. Finally, a truth-conditional formula is derived at the top type *t* node.

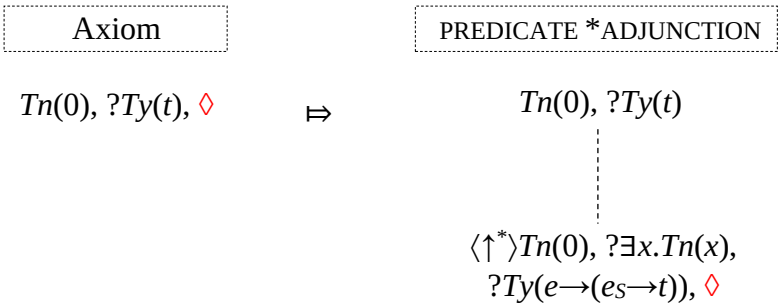
Next, consider an utterance such as (361)(b) uttered in the context of the question in (361)(a).

(361) (a) pranav kahaaN hai
Pranav.M where be.PRS.3SG
'Where is Pranav?'

(b) aa rah-aa hai
come PROG-M.SG be.PRS.3SG
'(He) is coming.' (elicited)

Following an analysis in line with Gibson (2012), I assume that the verb stem *aa-* 'come' does not project the whole propositional template and is parsed in the context of a requirement for a predicate node. A requirement for a predicate node can be projected via building an unfixed predicate node with the rule of PREDICATE *ADJUNCTION, as in (362) (see Section 3.4.2.6 for its formulisation as proposed by Gibson, 2012).

(362) Building an unfixed predicate node



The rule leaves the pointer at the unfixed predicate node. This allows the parse of the verb stem *aa-* as per the initial IF statement in its lexical entry, given in (363). The lexical actions projected by *aa-* 'come' decorate the node with a complete type and formula, yielding the structure in (364).

(363) Lexical entry for verb stem *aa-*

aa -	IF	?*Ty*(*e*→(*e*$_S$→*t*)),
	THEN	put(*Ty*(*e*→(*e*$_S$→*t*))), *Fo*(Aa')
	ELSE	Abort

(364) Parsing *aa-*

Tn(0), ?*Ty*(*t*)

⟨↑*⟩*Tn*(0), ?∃*x*.*Tn*(*x*),
?*Ty*(*e*→(*e*$_S$→*t*)),
Ty(*e*→(*e*$_S$→*t*)),
Fo(Aa'), ◊

A step of THINNING eliminates the satisfied type requirement at the unfixed node and COMPLETION takes the pointer to the top node. Next, the progressive auxiliary *rah-* 'stay/live' can be parsed. Not to get too side-tracked, the lexical entry I propose is only partial as it does not reflect all different uses of *rah-*[46]. I argue that both the main verb and progressive auxiliary uses of *rahaa* (or *rahii*, *rahe*, depending on gender and number) come with a requirement to

[46] A complex lexical entry needs to be constructed to capture all different auxiliary uses of *rah-* which is not necessary for the discussion here. In addition to its progressive use and its main verb use, it is also used to express iteration in combination with a main verb in the imperfective, as in (i) and (ii) below; see Butt and Rizvi (2010) for a discussion on tense and aspect in Urdu. The different uses can be modelled with conditions on the context in which parsed, such as before-after a predicate formula is introduced or before-after an event predicate node is built.

(i) raam kaam kar-t-aa **rah-aa**
Ram.M work do-IMPF-M.SG PROG-PFV.M.SG
'Ram kept working.'

(ii) raam kaam kar-t-aa **rah-t-aa**
Ram.M work do-IMPF-M.SG PROG-IMPF-M.SG
'Ram keeps working.'

be parsed in the context of no fixed structure (this ensures that *rah-* does not co-occur with the ergative marker *=ne* as a progressive auxiliary or as a main verb). However, in its auxiliary use *rah-* does not contribute a formula value, unlike its main verb use. For simplicity, (365) shows only the progressive auxiliary use of *rah-*, plus agreement.

(365) Lexical entry for *rah-aa* (partial)

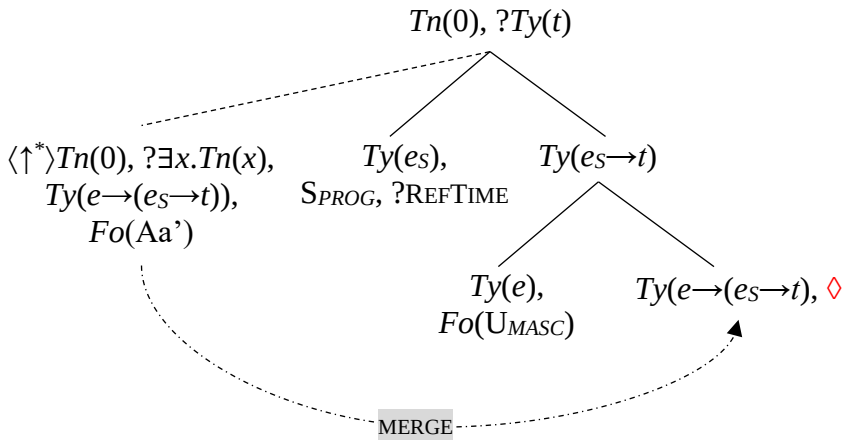
rah-aa

IF	?*Ty*(*t*), *Tn*(*n*), ⟨↓$_0$⟩⊥	
THEN	IF	⟨↓*⟩Ty(e→(e$_S$→t)), Fo(α)
	THEN	make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e$_S$*), S$_{PROG}$, ?REFTIME, go(⟨↑$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e$_S$*→*t*)), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(U$_{MASC}$)), go(⟨↑$_0$⟩) make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e*→(*e$_S$*→*t*))
	ELSE	…
ELSE	Abort	

The lexical entry starts with the requirement that *rah-aa* is parsed in the context of no fixed event structure. Then, if this is satisfied, a second IF condition follows to check if there is an unfixed predicate node, decorated with a formula value in the partial tree under construction. The availability of a predicate formula value decides that it is the auxiliary use of *rah-aa* that is intended, and the parse can continue accordingly. This is exactly the case in (364) where the verbal stem *aa-* 'come' has projected an unfixed predicate node decorated with a formula value. The pointer builds an event node decorating it with a situation argument S of type e_S, as well as information about the aspectual organisation of the event and a requirement that the event is fixed in the flow of time in relation to the utterance time, represented here as a requirement for a reference time - ?REFTIME. The pointer also builds an event predicate node of type $e_S \rightarrow t$ and from there projects a fixed argument node of type *e* decorated with a restricted metavariable

projected by agreement morphology (the 'subject' node), as well as a fixed functor node of type $e \rightarrow (e_S \rightarrow t)$. The structure in (366) emerges which shows the unification of the unfixed predicate node with the predicate node projected by the *rah-* auxiliary.

(366) Parsing *aa rahaa*



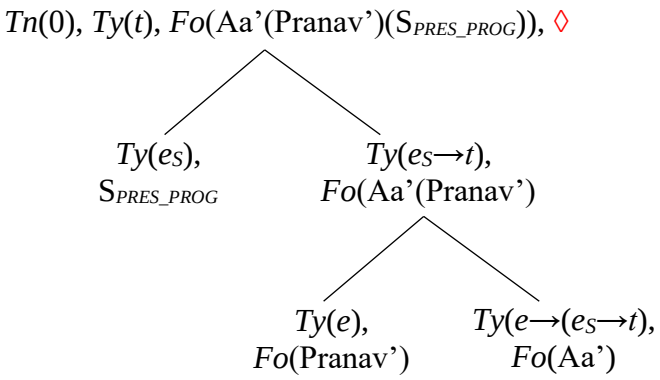
Upon the completion of the node, the pointer moves to the 'subject' node by ANTICIPATION. Given the context in which (361)(a) is realised, the dropped subject is retrieved from the context via SUBSTITUTION. This allows the pointer to move upward via computational rules accumulating information along the way. Before the parse is complete, the only outstanding requirement is that the described event is fixed in the flow of time. This has been formulated as the requirement *?*REFTIME but such a representation of tense and aspect information is overly simplistic, and the reader is referred to Cann (2011) for a more detailed approach. The tense-carrying *ho-* auxiliary provides what is necessary for the completion of the parse. The lexical entry in (367) is formulated for the present tense auxiliary *hai.*

(367) Lexical entry for *hai*

hai	IF	?*Ty*(*t*)
	THEN	make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(e_S), S$_{PRES}$), go(⟨↑$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(e_S→*t*)), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e*→(*e*$_S$→*t*)), *Fo*(U)), go(⟨↑$_1$⟩), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(U))
	ELSE	Abort

The THEN line of the lexical entry instructs the parser to build an event node and decorate it with type information and a metavariable S$_{PRES}$; it also builds a fixed predicate and subject node. Note that in (366) the event, predicate and subject nodes are already built; the actions triggered by the auxiliary simply re-build nodes that collapse with already existing structure due to identical tree node address and type specifications. This is the analysis proposed in Gibson and Marten (2016) for complex verbal constructions in Bantu. The effect is the unification of information projected by the progressive auxiliary *rahaa* and the present tense auxiliary *hai* on the same node. Information projected by the auxiliary satisfies the requirement that the event is fixed in the flow of time and the pointer can move upwards via computational rules to establish the truth-conditional formula at the top node. The final tree is given in (368).

(368) Completed propositional structure for *(pranav) aa rahaa hai*



So far, I have shown that the parse of the finite verb is what helps identify the edge of a propositional boundary in Hindi and triggers the compilation of information at the finishing stages for deriving a truth conditional formula. The building of a fixed 'subject'[47] node is tightly linked to the parse of verbal morphology which unfolds a complete propositional template. As I do not develop the construal of the event term in detail, I will often supress the event node in the discussion that follows for simplicity. This means that the restriction to be parsed in the context of no fixed event node can be reformulated as the restriction to be parsed in the context of no fixed subject node. This will be expressed again as the condition 'IF $\langle\downarrow^0\rangle\bot$' which states that if below an argument relation the falsum holds, i.e. there is no fixed daughter argument node, then proceed. When the pointer encounters such an IF condition at the type *t* node the immediate argument node is the 'subject' node, if the event node is omitted.

This section concentrated on modelling subject-verb agreement in Hindi in non-perfective clauses. In what follows I turn to transitive clauses and the parse of objects.

5.4.2 Parsing objects

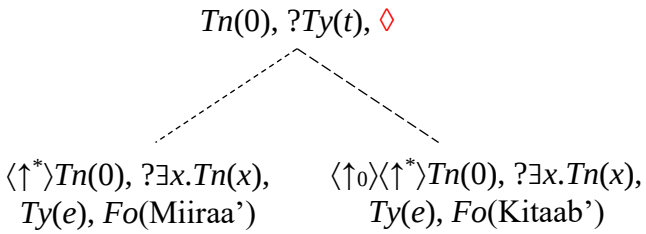
For the parse of an utterance such as (369), there are two strategies available for parsing a left-peripheral subject NP: a LINKed structure or an unfixed node. The choice is not completely arbitrary but is linked to the discourse context and interlocutors' communicative needs (see Chapter 6).

(369) miiraa kitaab k^{h}arid-egii
Mira.F book.F buy-FUT.F.3SG
'Mira will buy a book.'

[47] Note that I refer to the immediate argument daughter of a node of type *t* as the 'subject' node for convenience but DS tree structures do not hold information about grammatical functions.

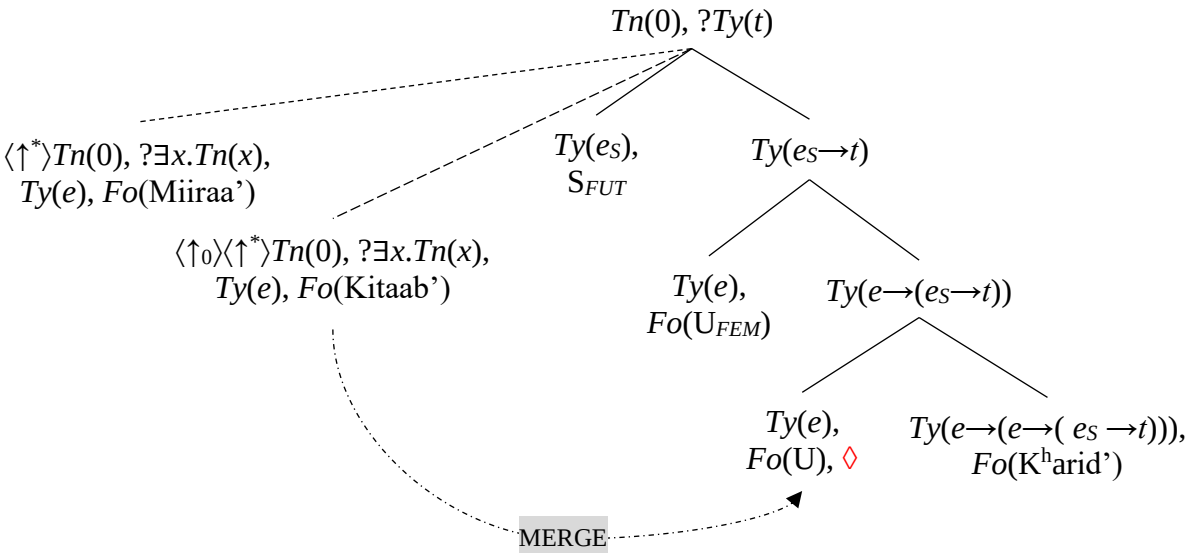
I hypothesise a scenario in which at the onset *ADJUNCTION builds an unfixed node for the parse of *miiraa* which projects type and formula specifications. Next, the rule of LOCAL *ADJUNCTION applies to build a locally unfixed node for the parse of the next type *e* expression – *kitaab* 'book'. THINNING and COMPLETION apply as usual. A snapshot of the derivation is given in (370).

(370) Parsing *miiraa kitaab*



Next, the future verb unfolds the propositional structure, as in (371). Now, in principle either of the nodes can merge with the internal argument node but there is only one option that would yield a pragmatically acceptable proposition. Considering that it is only humans that can be the agent of an event of buying, the locally unfixed node that carries an inanimate concept is chosen to merge with the internal type *e* node.

(371) Parsing *k*^{h}*arid-egii*

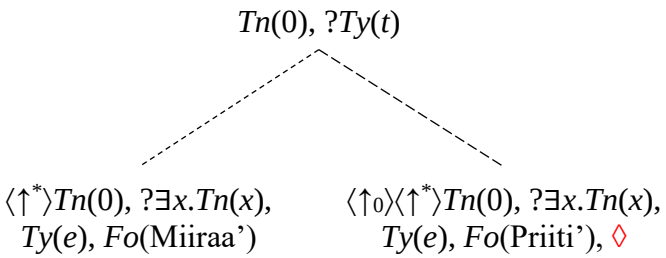


This analysis is not unproblematic as it relies on the pragmatics not the merge the node carrying *Miiraa* with the internal type *e* node. Another potential problem is that the proposed analysis does not account for strictly local structure building but relies heavily on the availability of *ADJUNCTION and LOCAL *ADJUNCTION at the onset. This implies that any initial expression parsed via *ADJUNCTION potentially could be displaced from an embedded clause. While this is not a problem, I reflect on a possible analysis for an account of strictly local structure building in Section 5.4.3.

In the case of proper names, as in (372), the object NP is unambiguously marked as a non-agent with the accusative marker *=ko*. The parse will start with the building of an unfixed node via *ADJUNCTION for the parse of *miiraa*. Then, *priiti* is parsed at a locally unfixed node, yielding the structure in (373).

(372) miiraa priiti=ko maar rah-ii hai
Mira.F Priti.F=ACC hit PROG-F be.PRS.3SG
'Mira is hitting Priti.'

(373) Parsing *miiraa priiti*



With the pointer still at the locally unfixed node of type *e*, the *=ko* marker can be parsed. The role of *=ko* is to specify how the expression fits within the unfolding propositional structure. At the point of parsing *priiti=ko,* however, it is not clear whether the expression will 'end up' the patient of a transitive construction or the recipient of ditransitive construction. To account for this uncertainty, I propose that *=ko* does not fix the tree node address immediately but

narrows done possibilities for how the node is to be fixed within the emerging tree. I propose the lexical entry in (374) for *=ko* which reflexes the underspecified nature of its contribution:

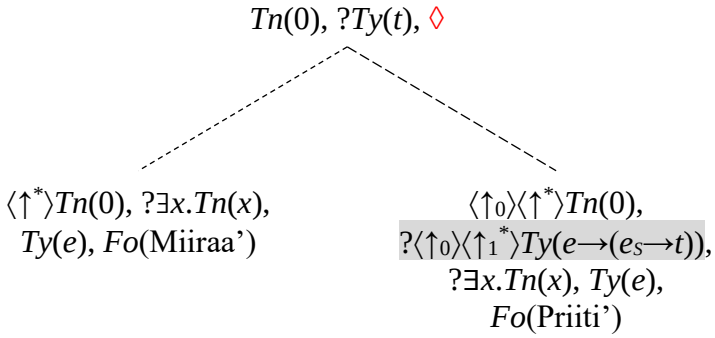
(374) Lexical entry for *=ko* (simplified)

=ko	IF	$Ty(e) \wedge Fo(\alpha) \wedge \langle\uparrow^*\rangle Tn(0)$
	THEN	put($?\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle Ty(e\rightarrow(e_S\rightarrow t))$)
		go($\langle\uparrow^*\rangle Tn(0)$)
	ELSE	Abort

The proposed lexical entry essentially treats *=ko* as a non-agent marker indicating that the node is to be dominated by a predicate node under an unspecified number of functor relations. It instructs that if the pointer is at a type *e* and formula complete unfixed node, then it decorates the node with the requirement $?\langle\uparrow_0\rangle\langle\uparrow_1{}^*\rangle Ty(e\rightarrow(e_S\rightarrow t))$ which states that 'up' an argument relation and 'up' an unspecified number of functor relations (zero or more) a node of type $e\rightarrow(e_S\rightarrow t)$) is to be found. This ensures that the node carrying *Fo*(Priiti') will not 'end up' as the argument daughter of an event predicate node ($\langle\uparrow_0\rangle Ty(e_S\rightarrow t)$) and will not be interpreted as the agent of an event of hitting. This reflects the obligatory realisation of *=ko* with proper names which are by default very likely agents (see Chapter 4). Finally, the pointer returns to the node from which the unfixed relation is built. This move ensures that the 'object' NP is not

developed any further. The effect of parsing *=ko* is given in (375) (the newly added requirement is highlighted):[48]

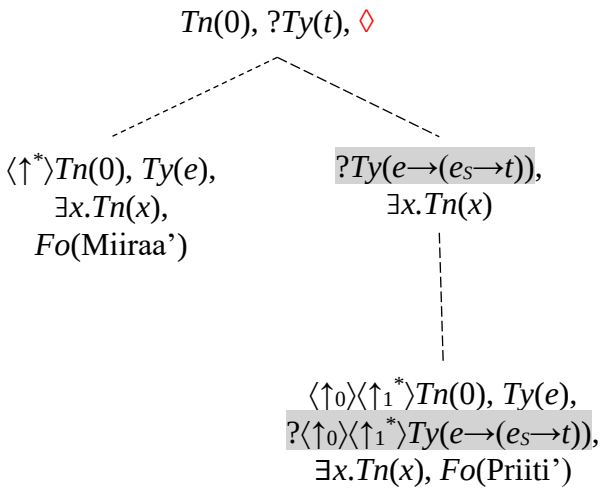
(375) Parsing *miiraa priiti=ko*



We can argue that the *=ko* marker has a much more constructive role by virtue of the context in which it is parsed: as it is parsed onto a locally unfixed node in the example discussed, it instructs the pointer that the expression it attaches to is some argument under the very predicate node that is within the local propositional domain, i.e. the 'local predicate' node and not some predicate node further embedded down another type *t* node. This can be sketched out as in (376):

[48] Note, however, that this lexical entry is partial as it does not account for Hindi varieties which allow both the theme and recipient to be marked with *=ko* within the same clause (strictly following a theme-recipient word order; see Bhatt and Anagnostopoulou, 1996). In such cases, the first *=ko* marked NP is parsed as dominated by a node of type $e\rightarrow(e_S\rightarrow t)$ as per the proposed lexical entry, along an unspecified number of functor relations to reflect the observation that at this point it is still not known whether the clause will 'end' up monotransitive or ditransitive. When a second *=ko* marked NP is parsed, *=ko* projects information to fix the node carrying the recipient as the argument daughter of a node of type $e\rightarrow(e\rightarrow(e_S\rightarrow t))$. The tree node address of the first *=ko* marked expression is then fixed as the argument daughter of a node of type $e\rightarrow(e_S\rightarrow t)$. I will not go into more details for an account of ditransitives as they require more work. Also, the adjunct uses of *=ko* need to be addressed further.

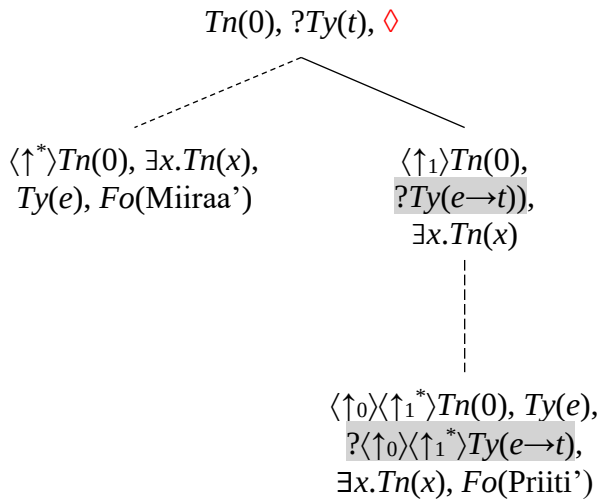
(376) Parsing *miiraa priiti=ko*



If we temporarily supress the event node for illustrative purposes, it would yield a much simpler structure as in (377) in which the *=ko* marker has a constructive role in clearly identifying that the type *e* node is to be parsed as locally unfixed with respect to the predicate node within the most local propositional domain. This is the role of *=ko* when parsed onto a locally unfixed node but under long distance scrambling and/or in initial position, it would only impose a 'filter' to be parsed with respect to some predicate node whether it is local or non-local to the root type *t* node.[49]

[49] Note that this opens up possibilities to explain why 'dative' proper names in initial position show subject properties with particular verbs such as *mil-* 'meet/encounter' (Mohanan, 1990, 1992, 1994). Under the DS approach here, the 'subject' would be some expression parsed onto an unfixed node at the start of a parse. As we will see, there are other means through which to interpret a subject: it can be fixed directly via the ergative marker, it can be parsed onto a LINK structure, or it can be parsed onto an unfixed node at the beginning of a parse.

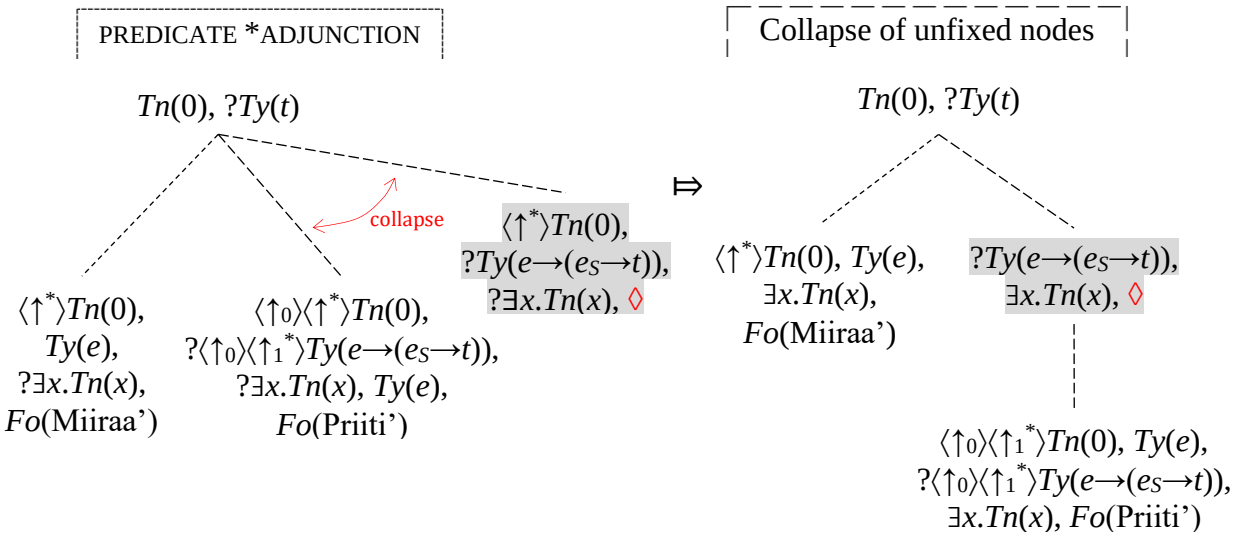
(377) Parsing *miiraa priiti=ko* (simplified structure)



Next, for the parse of (372), repeated in (378), the verbal stem *maar-* 'hit' is parsed. Following an analysis in line with Gibson (2012, 2018), I assume that the verb stem *maar-* 'hit' does not project the whole propositional template and is parsed in the context of a requirement for a predicate node projecting only an internal type *e* argument node and a functor of type $Ty(e \rightarrow (e_S \rightarrow t))$. A requirement for a predicate node can be projected via building an unfixed predicate node with the rule of PREDICATE *ADJUNCTION. Note, however, that it will collapse with the already existing structure in the tree, as shown in (379).

(378) miiraa anu=ko maar rah-ii t^h-ii
Mira.F Anu.F=ACC hit PROG-F be.PST-F
'Mira was beating Anu.'

(379) Building an unfixed predicate node via PREDICATE *ADJUNCTION



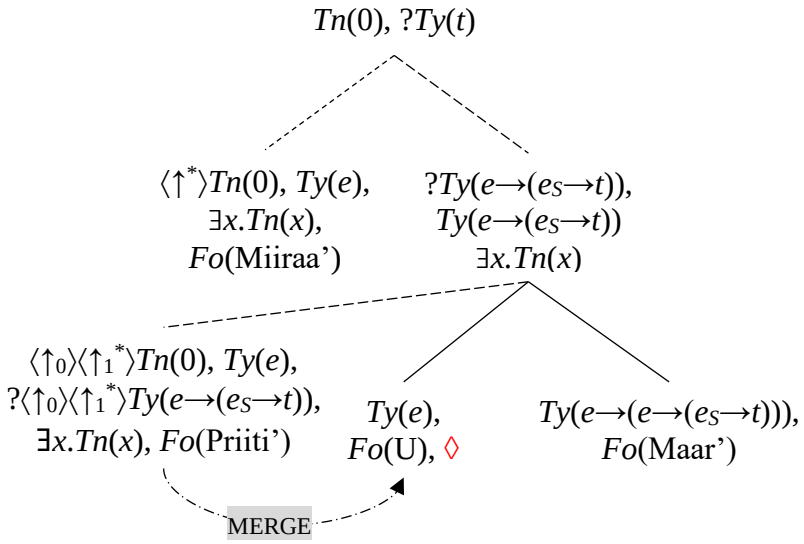
The structures in (379) show that once the unfixed predicate node is built, it collapses with already existing structure. The unfixed type *e* node specifies that it needs to find such a tree node address that it is dominated by a node of type $Ty(e\rightarrow(e_S\rightarrow t))$, i.e. a predicate node. The newly built unfixed predicate node happens to be of such a type, and it unifies along the same locally unfixed relation with the type *e* node carrying the formula Priiti'. The pointer is left at the predicate-requiring node (as per the PREDICATE *ADJUNCTION rule prior to the collapse) which gives the right context for the parse of the verbal stem *maar*-. The lexical actions projected by *maar*- are given in (380).

(380) Lexical entry for verb stem *maar*-

maar-	IF	$?Ty(e\rightarrow(e_S\rightarrow t))$
	THEN	put($Ty(e\rightarrow(e_S\rightarrow t))$),
		make($\langle\downarrow_1\rangle$), go($\langle\downarrow_1\rangle$),
		put($Ty(e\rightarrow(e\rightarrow(e_S\rightarrow t)))$, Fo(Maar')),
		go($\langle\uparrow_1\rangle$), make(($\langle\downarrow_0\rangle$), go(($\langle\downarrow_0\rangle$),
		put($Ty(e)$, Fo(U))
	ELSE	Abort

With the pointer at a node with a requirement for an expression of type $e \rightarrow (e_S \rightarrow t)$, the parse of *maar-* can proceed by decorating the node with a complete type specification. Then, the pointer builds a functor node of type $e \rightarrow (e \rightarrow (e_S \rightarrow t))$ which it decorates with the formula *Maar'*. The pointer returns to the $e \rightarrow (e_S \rightarrow t)$ node and builds an argument node of type *e*, decorated with a metavariable (the 'object' node). The emerging structure is given in (381). The locally unfixed type *e* node inevitably merges with the type *e* node projected by *maar-* due to their compatible decorations.

(381) Parsing *miiraa priiti=ko maar*



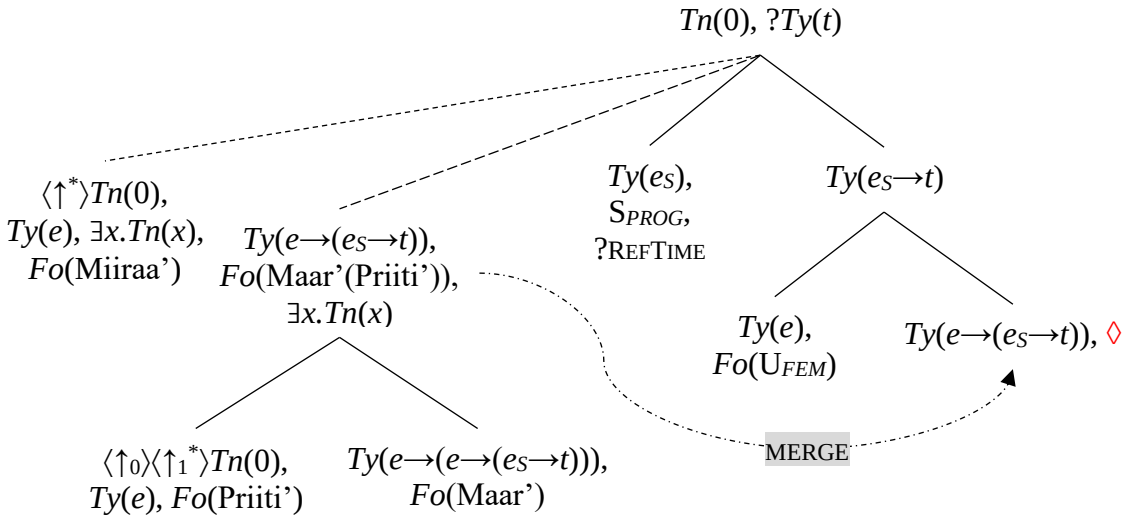
As Hindi is often pointed out to be a fully pro-drop language[50] the analysis proposed assumes that a transitive verb stem projects an internal type *e* node, decorated with a metavariable. This captures the fact that Hindi can drop objects in addition to dropping subjects. However, I would like to open a bracket here by saying that this analysis might need to be revisited to account for object drop as re-use of structure or re-use of parsing actions

[50] The drop of arguments is linked to the discourse; what is dropped are continuing topics or background information. See Butt and King (1997).

(Kempson et al., 2015; Kempson, Gregoromichelaki, & Eshghi, 2019), rather than being licensed by a process of SUBSTITUTION of the *Fo* value from the context. In this case, the verb stem will not project a metavariable at the internal type *e* node. However, observations from previous work on Hindi pro-drop (Butt & King, 1997; Prasad, 2000) do not inform a conclusive DS analysis and I leave this to one side as more empirical work is needed.

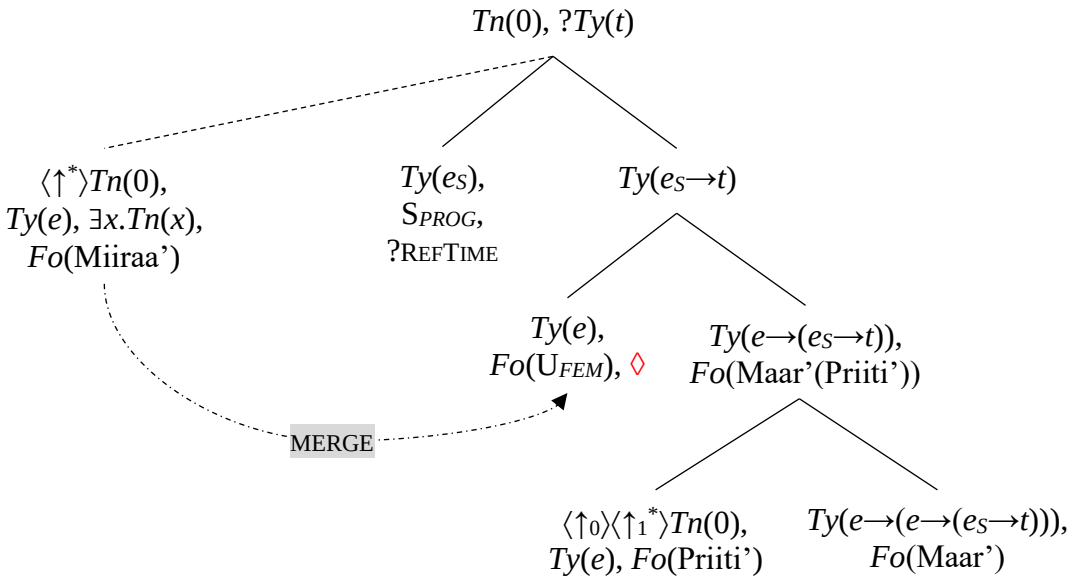
Returning to the parse in (381), after the merge of the locally unfixed node with structure projected by the verbal stem, THINNING deletes the satisfied requirements and COMPLETION moves the pointer upwards. The rule of ELIMINATION derives the predicate formula Maar'(Priiti') at the $e\rightarrow(e_S\rightarrow t)$ node. After one more step of THINNING and COMPLETION, the pointer returns to the top node, ready for the parse of the progressive auxiliary plus agreement (see the lexical entry for the auxiliary proposed in (365)). From the type-*t*-requiring node the progressive auxiliary builds an argument daughter of type e_S which it decorates with a situation argument decorated with a metavariable S and information about the aspectual organisation of the event, as well as a fixed event predicate node of type $e_S\rightarrow t$. Further, from there, it projects a fixed argument daughter node of type *e* node decorated with a restricted metavariable (contributed by agreement marking) and a functor daughter of type $e\rightarrow(e_S\rightarrow t)$ node. This allows the unfixed nodes in the tree structure to merge with the projected fixed structure. With the pointer at the $e\rightarrow(e_S\rightarrow t)$ node, the unfixed predicate node can merge with it, as illustrated in (382), due to their compatible decorations.

(382) Parsing *miiraa priiti=ko maar rah-ii*



After THINNING and COMPLETION of the $e \rightarrow (e_S \rightarrow t)$ node, the pointer moves to the mother node of type $e_S \rightarrow t$. Then, the pointer moves to its argument daughter of type e via ANTICIPATION for the completion of the 'subject' node. As a next step, the unfixed node merges with the 'subject' node, as shown in (383), satisfying requirements at each of the nodes.

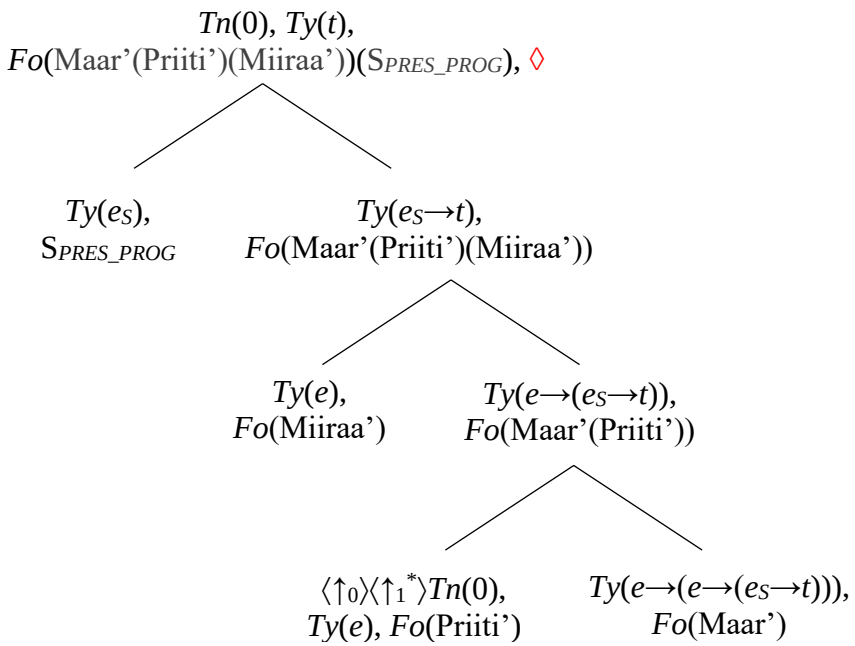
(383) Parsing *miiraa priiti=ko maar rah-ii* – MERGE of unfixed node with 'subject' node



Completing the 'subject' node allows the pointer to move upwards and complete the event predicate node via ELIMINATION, yielding the formula *Fo*(Maar'(Priiti')(Miiraa')). The completion of the $e_S \rightarrow t$ node allows the pointer to move to the top type *t* node, from where the tense-carrying auxiliary can be parsed.

The present tense auxiliary *hai* re-builds part of the structure (Gibson & Marten, 2016) and projects information about the temporal organisation of the node at the e_S node (see the lexical entry proposed in (367)). This acts as a trigger for the completion of the event node as it satisfies the requirement for a reference time in relation to the utterance time (here somewhat sketchy represented as ?REFTIME). The COMPLETION rule moves the pointer to the top type *t* node and ELIMINATION yields the final truth-conditional formula: *Fo*(Maar'(Priiti')(Miiraa'))(S_{PRES_PROG}). (384) shows the fully completed propositional tree structure with all requirements satisfied:

(384) Fully completed tree structure for *miiraa priiti=ko maar rah-ii hai*



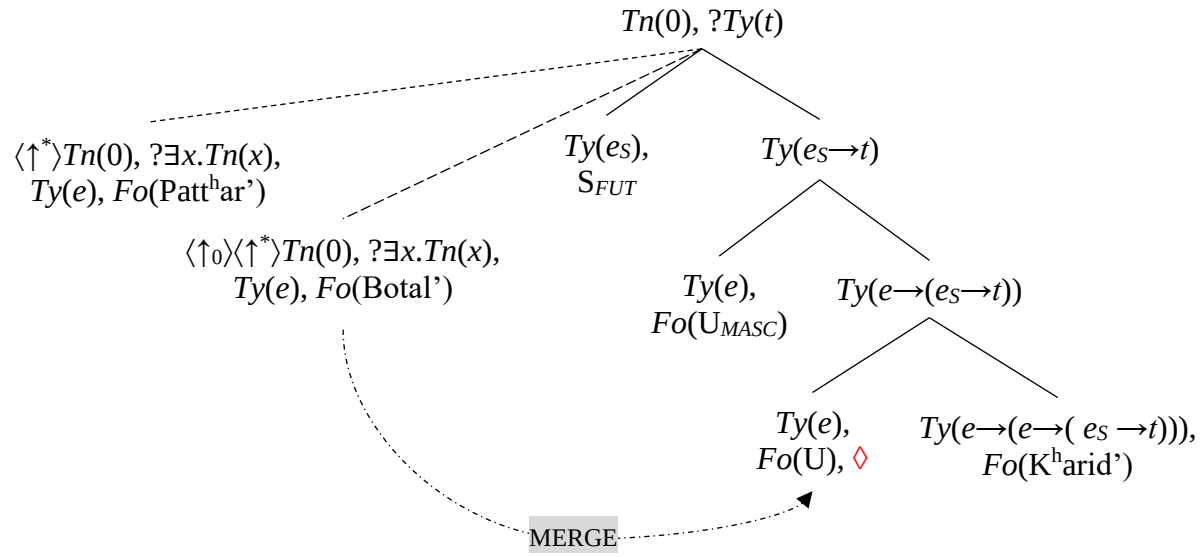
As I pointed out earlier, the analysis developed this far is not unproblematic as it relies heavily on the pragmatics not to merge an unmarked proper name with the internal ('object') node (see the discussion for (369)). This raises the question of common nouns and especially inanimates which do not require any marking as objects, as in (385) (repeated from (105)) and (386).

(385) patt^{h}ar botal toR-egaa
stone.M bottle.M break- FUT.M.3SG
(i) 'The stone will break the bottle.'
(ii) *'The bottle will break the stone.' (Mohanan 1992 via Lee 2001: 14; adapted)

(386) dek^{h}-o dek^{h}-o, gaay b^{h}aiNs caaT rah-ii hai
look-IMP look-IMP cow.F buffalo.F lick PROG-F be.PRS.3SG
'Look, look, a cow is licking a buffalo' (Gambhir, 1981: 282)

Under the analysis proposed, for the parse of (385) the structure in (387) emerges. Mohanan (1992) explains that when there are two unmarked inanimate NPs in the same gender and number word order 'freezes' to SOV (see also Lee, 2001). The only possible interpretation is that the nominal expression closer to the verb joins the predication.

(387) Parsing *patt^{h}ar botal toR-egaa*



What seems to be the case is that in the absence of morphological and/or contextual information a 'default' route for interpretation is followed which takes place with, for example, out-of-the-blue utterances in which no part of the utterance is presupposed. I argue that the 'freeze' to basic SOV word order has to do with 'routinised' structure building (Kiaer, 2013, 2014). The parser defaults to a reading in which the expression closer to the verb combines with it first to establish what is predicated of the subject.

I have argued so far that Hindi unmarked NPs are associated with structural underspecification that is resolved as more information becomes available. As we saw, Hindi freely allows a sequence of two (subject and object) unmarked NPs within a single clause. The analysis so far relied heavily on the availability of the rules of *ADJUNCTION and LOCAL *ADJUNCTION for the parse of a sequence of two type *e* expressions. In what follows, I reflect on possible directions for an account of strictly local structure building.

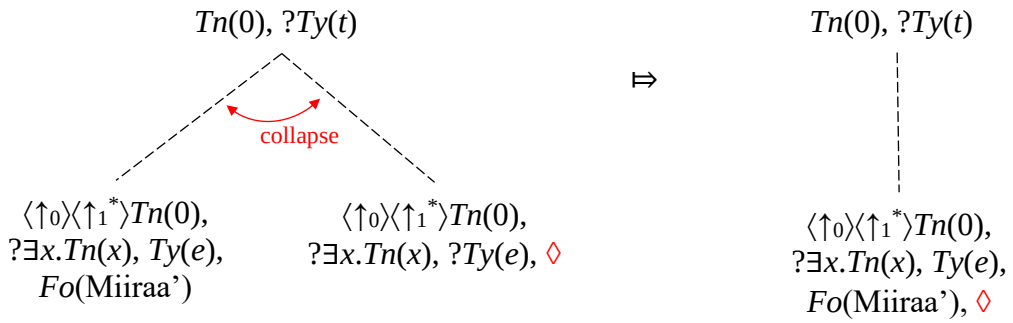
5.4.3 Reflections on local structure building and differential object marking

In previous DS work case markers are treated as 'output filters'. They specify the tree node address of the node under development in relation to other nodes in the tree. In head-final languages such as Japanese and Korean the constructive role of case has been shown to be instrumental for allowing local scrambling (Cann et al., 2005; Kempson & Kiaer, 2009a, 2009b; Kempson et al., 2009; Kiaer, 2007). In the DS model two locally unfixed nodes cannot be present at the same time within a single propositional domain as they will simply collapse into one locally unfixed node, given their identical tree node address decorations. The result of the collapse will be the unification of all specifications at a single locally unfixed node. Case marking is what is argued in languages like Japanese and Korean to provide the necessary information for a locally unfixed node to find a tree node address. This in turn allows a locally unfixed node to be built again for the parse of any subsequent nominal expression.

So far, I have argued that Hindi unmarked NPs are associated with structural underspecification that is resolved as more information becomes available. This is potentially problematic, should an analysis be pursued that reflects strictly local structure building. This is because if an initial unmarked NP is parsed onto a locally unfixed node, the rule of LOCAL *ADJUNCTION cannot be used for the parse of any subsequent NP as it would simply collapse with the already existing locally unfixed node. This is illustrated in (389). Upon the firing of a second locally unfixed node it collapses with the first and leaves the pointer there for the parse of the next nominal expression.

(388) miiraa kitaab k^{h}arid-egii
Mira.F book.F buy-FUT.F.3SG
'Mira will hit Sita.'

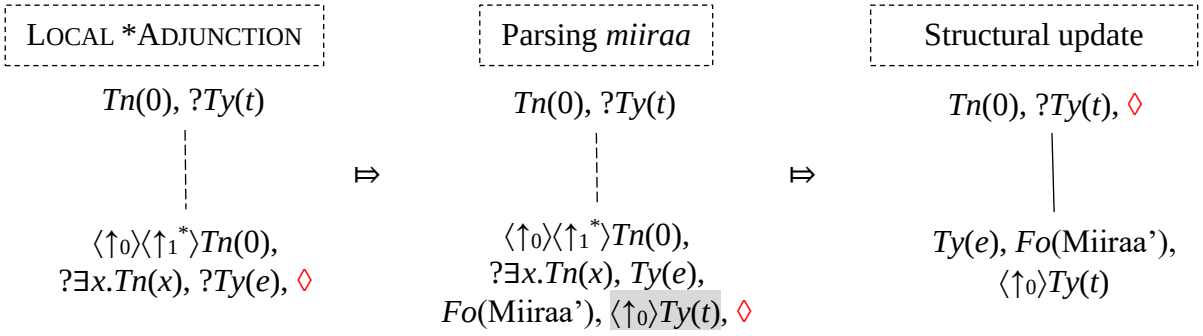
(389) Parsing **miiraa siitaa*



Because of the restriction for a single unfixed node of a certain type, I proposed that the parsing sequence for an utterance such as (389) starts with the rule of *ADJUNCTION or a LINKed structure in the case of a left-peripheral topical NP. However, alternatively a potential 'fix' would be to assume that unmarked proper names are always parsed on a tree node that is the immediate argument daughter of a type *t* node – $\langle\uparrow_0\rangle Ty(t)$ (or, if the event node is included in the representation – $\langle\uparrow_0\rangle Ty(e_S \rightarrow t)$).[51] This means treating unmarked proper names as nominative. Consequently, a proper name that is to find a different tree node address, will need to be marked somehow. A reflection of this is the obligatory realisation of *=ko* with proper names. To illustrate, a 'nominative' proper name parsed onto a locally unfixed node will impose a requirement $\langle\uparrow_0\rangle Ty(t)$, i.e. that it finds a tree node address as the immediate argument daughter of a type-*t*-requiring node:

[51] The only problem with such a proposal is that passives will need an analysis in the style Cann's (Cann, 2018) recent proposal for a radical re-think on the representations of tree structures and an analysis where passive constructions do not involve the building of an agent node.

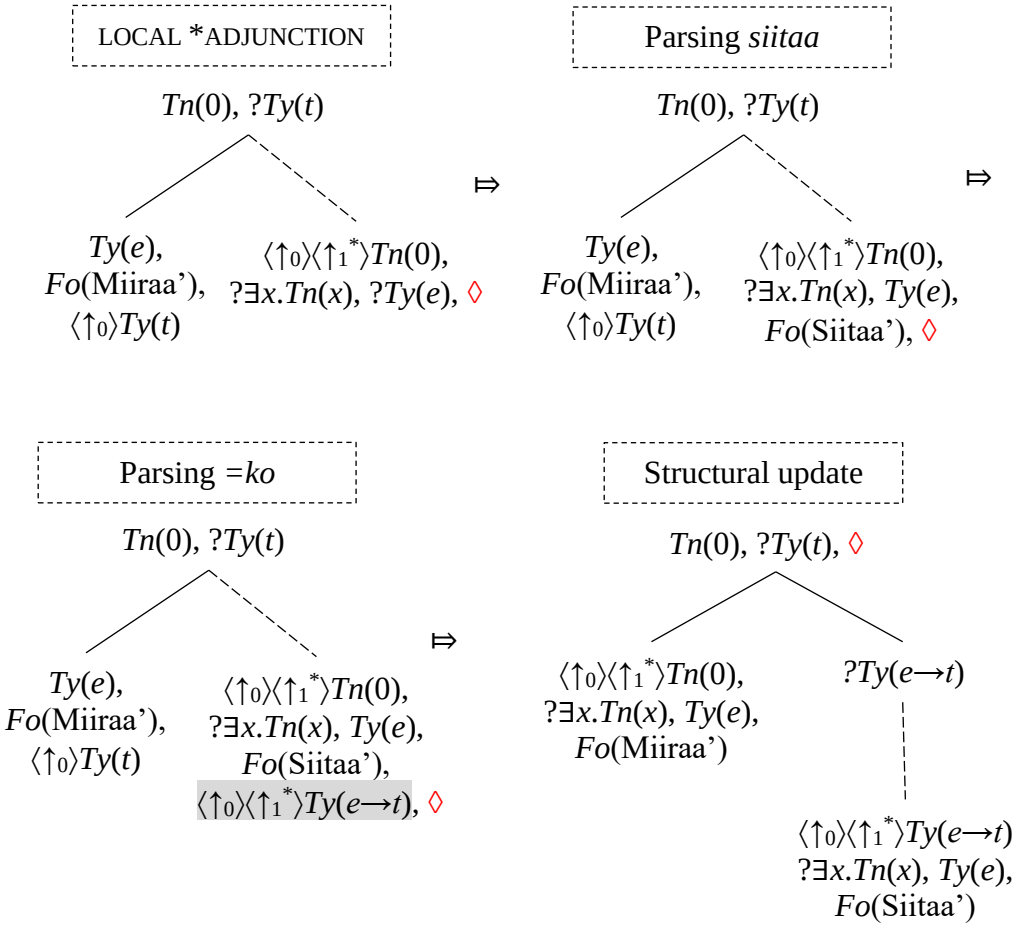
(390) Local structure building: Parsing *miiraa*



First, the rule of LOCAL *ADJUNCTION builds a locally unfixed node. The parse of *miiraa* decorates the node with type and formula specification, as well as the requirement that the unfixed node finds such a tree node address that its mother is a node of type *t* along an argument relation. As *miiraa* is parsed onto a locally unfixed node, there is only one node that can satisfy this requirement, namely the 'subject' node, and the node is structurally updated. This allows LOCAL *ADJUNCTION to launch again for the parse of a second NP. In (391) the accusative/dative marker *=ko* ensures that the object proper name is dominated by a predicate node. The structures in (392) show the parse of *siitaa=ko* in the context of a fixed 'subject' node (the event node is not shown to ensure readability of the tree).

(391) miiraa siitaa=ko maar-egii
Mira.F Sita.F=ACC hit-FUT.F.3SG
'Mira will hit Sita.'

(392) Parsing *siitaa=ko*



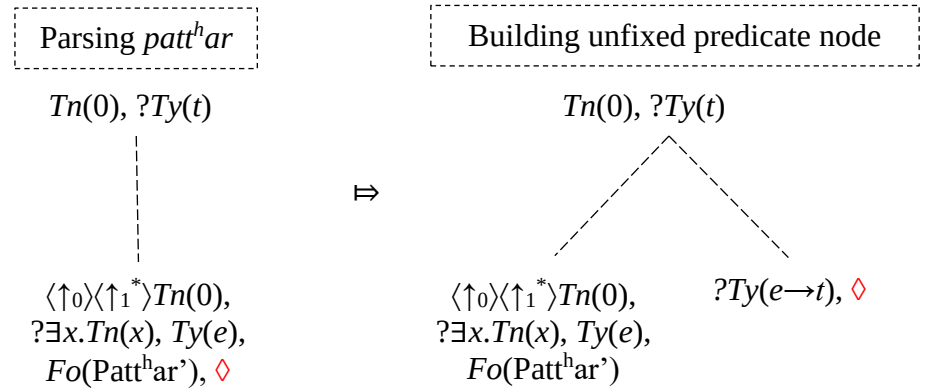
First, the proper name *siitaa* is parsed onto a locally unfixed node. Next, the accusative/dative marker imposes the requirement ⟨↑0⟩⟨↑1*⟩*Ty*(*e*→*t*) which ensures that the node is to be parsed as dominated by a predicate type node. As the marker is parsed on a locally unfixed node it fixes the predicate node with respect to the local type *t* node.

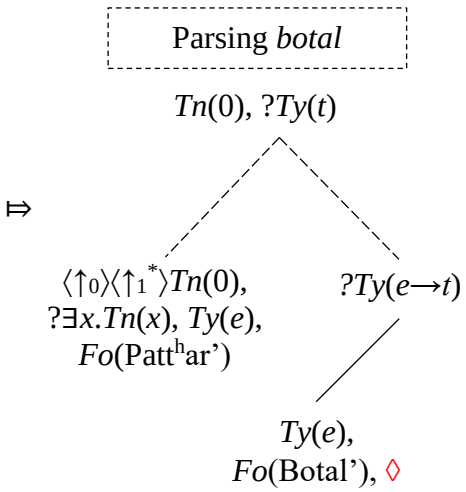
Common noun objects are not obligatorily case-marked. I hypothesise that this is because common nouns can be parsed in the context of a requirement for a predicate type, unlike proper names. Just as verbal stems can be parsed onto an unfixed predicate node, common nouns can be modelled to join the predication in a similar fashion. Under strictly local structure building, in the context of an already built locally unfixed node with no specifications

as to its tree node address, a second type *e* expression can only be parsed relative to a predicate node. To take (393) (repeated from (105)), the initial noun *patt*^{h}*ar* 'stone' is parsed onto a locally unfixed node. Next, an unfixed predicate node is built, which acts as a trigger for the parse of the common noun, as shown in (394). A 'default' local structure building route is followed in which the type *e* expression closer to the verb is parsed as joining the predication.

(393) patt^{h}ar botal toR-egaa
stone.M bottle.M break- FUT.M.3SG
(i) 'The stone will break the bottle.'
(ii) *'The bottle will break the stone.' (Mohanan 1992 via Lee 2001:14)

(394) Parsing *patt*^{h}*ar botal*





The sketch in (394) indicates that the lexical entry of a common noun can be expanded to include a predicate type trigger relative to which the object type *e* expression is fixed. Such a proposal would necessitate revisiting the lexical entries proposed for nominal expressions and the type of triggers that allow their parse. The bonus of such an approach is that it gives us a direction for an analysis that captures how unmarked nominals (especially animate and human objects) join the predication as unindividuated objects. Moreover, it opens possibilities for pursuing an analysis of differential object marking as a result of the interplay of different properties of nominal expressions (i.e. conditions in their lexical entries) and restrictions on localised structure building.

This section has proposed a more localised structure building process but nonetheless the availability of both *ADJUNCTION and LOCAL *ADJUNCTION in the left periphery remain important rules for an account of 'marked' constructions, understood here as deviations from the default parsing route. These will be explored in Chapter 6. Before that, I discuss modelling the ergative pattern in Hindi.

5.5 Modelling the ergative pattern

An overview of the ergative pattern was presented in Section 5.2. I argued that the ergative marker =*ne*, given its very specialised use, identifies the most active participant that causes the event. It constructs and contributes partial information on the event node, such a requirement for a reference time to reflect the observation that =*ne* is realised only in finite clauses, well before the parse if the verb, preparing the hearer for the type of event predication that unfolds.

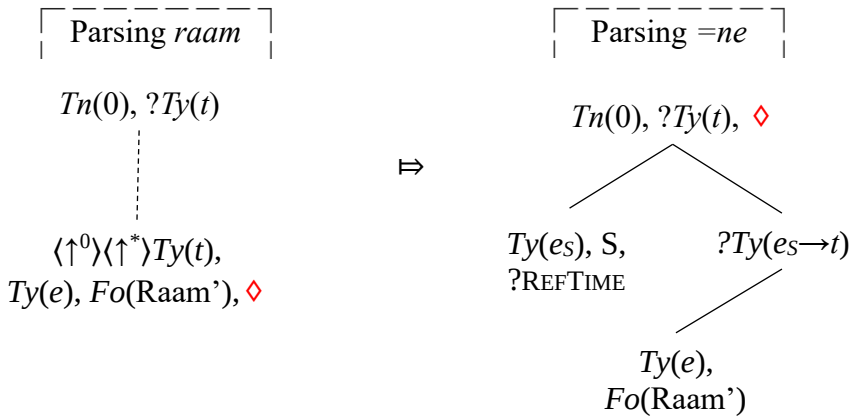
However, this is only scratching the surface[52] and I will not explore here the incremental construal of event structure in online parsing as this will constitute a significant detour. Here I will only concentrate on structural restrictions on the non-occurrence of *=ne* with certain verbs, leaving the incremental construal of the epsilon-bound event term for future work.

I formulate the lexical entry in (395) for *=ne*. The effect of running the lexical actions is given in (396):

(395) Lexical entry for *=ne*

=ne	IF	*Ty*(*e*), Fo(α) ∧⟨↑*⟩?*Ty*(*t*)
	THEN	make(⟨↑$_0$⟩), go(⟨↑$_0$⟩), put(?*Ty*(e_S→*t*)), go(⟨↑$_1$⟩), make(⟨↑$_1$⟩), go(⟨↑$_1$⟩), put(?*Ty*(*t*)), make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(e_S), S, ?REFTIME), go(⟨↑$_0$⟩)
	ELSE	Abort

(396) Parsing *raam=ne*



The lexical entry for *=ne* instructs the parser that if the pointer is at a node of a type *e* with a complete formula value, then the parse can proceed by building an upwards argument relation

[52] For example, some Hindi and Urdu varieties have extended the use of *=ne* to infinitive constructions for the expression of modal meanings, probably due to language contact with varieties in which ergative and dative are homophonous (Bashir, 1999; Butt, 2006; Butt & Ahmed, 2011; Phillips, 2014).

and a mother node of type $e_S \rightarrow t$. Then, from there the pointer builds a fixed node along a functor relation and decorates it with a requirement for type *t* (this collapses with already existing such decoration). From the type-*t*-requiring node the pointer builds an event node of type e_S and decorates it with a situation argument introduced as a metavariable S and a requirement for a reference time. Finally, the pointer returns to the type-*t*-requiring node.

The realisation of =*ne* is linked not so much to the transitivity of the clause but to what verb carries the perfective morphology. This is most evident in complex predicate constructions, as in (397) (repeated from (309)). The =*ne* marker is not realised with the complex predicate in (397) as the final perfective verb is the intransitive *jaa*- 'go' which does not co-occur with =*ne*, as also shown in (398) (repeated from (296)).

(397) is varsh bʰii chʰe janvarii=ko **ye** **baagʰ** tiin
this.OBL year also six January=KO these tiger.M three

gaayoN=ko maar-kar **kʰaa** **gaye**
cow.PL.OBL=KO hit/kill-CONJ eat go.PFV.M.PL

'This year also on the sixth of January these tigers killed and ate three cows.' (*lit.* 'having killed three cows, ate (them) up') (ehinweb147; Emille Hindi Corpus)

(398) Intransitive perfective clause:

(a) raam gayaa
Ram.M go.PFV.M.SG
'Ram went.' (elicited)

(b) *raam=ne gayaa
Ram.M=ERG go.PFV.M.SG
'Ram went.' (elicited)

The ungrammaticality of =*ne* with 'unaccusative' main and light verbs stems exactly from its constructive role. This is captured via a trigger in the lexical entry of the unaccusative

verb that it is to be parsed in the context of no fixed event node.[53] This is shown in (399) with the lexical entry for *gayii* (go.PFV.F).

(399) Lexical entry for *gayii*

gayii	IF	?*Ty*(*t*), *Tn*(*n*) ∧ ⟨↓$_0$⟩⊥
	THEN	make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(e_S), S$_{PAST}$), go(⟨↑$_0$⟩), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(e_S→*t*)), make(⟨↓$_1$⟩), go(⟨↓$_1$⟩), put(*Ty*(*e*→(e_S→*t*)), *Fo*(Aa')), go(⟨↑$_1$⟩); make(⟨↓$_0$⟩), go(⟨↓$_0$⟩), put(*Ty*(*e*), *Fo*(U$_{FEM}$))
	ELSE	Abort

Intransitive verbs that show optionality when it comes to the realisation of *=ne* can be modelled as showing no such strict trigger for the context in which they are parsed. The obligatoriness of *=ne* with (most) transitive verbs stems from the fact that they do not project a full propositional template. More concretely, an agent argument (or the external argument) is not projected. The transitive perfective verb projects only one type *e* node to be associated with its internal argument (the 'object') at which agreement morphology projects a restricted metavariable, reflecting the historical origin of the perfective verb from an adjectival participle construction or a past passive participle (Montaut, 2016; Verbeke & De Cuypere, 2009).

A fully worked out analysis of the ergative pattern, however, will have to await future work and I only make first steps in this direction here. The difficulty for accounting for the ergative pattern is the blocking of agreement marking which is not entirely clear how it is to be captured. Having said this, the analysis proposed here captures the ergative pattern only

[53] If the event node is not included in the representation, then this restriction can be reformulated as no fixed 'subject'. In both cases, this can be captured in the lexical entry as the condition that the parse of the perfective intransitive verb can go ahead only if there is no fixed structure 'down' an argument relation from the top type t node, i.e. ⟨↓$_0$⟩⊥ for 'below an argument relation the falsum holds.'

partially: it proposes an analysis which captures the non-occurrence of the ergative marker with some verbs but cannot fully explain why perfective transitive verbs agree only with unmarked objects and not with *=ko* marked objects. A solution to this would be to treat *=ko* marked arguments as external to the event predication via an anaphoric LINK relation; this, however, will be left for future work.

5.6 Summary and conclusion

This chapter has discussed in detail the role of the case markers *=ne* and *=ko*, as well as the role of verbs and verbal morphology in the parsing process. Case markers were shown to have a constructive role; they provide information which guides how the parse proceeds ahead of parsing the verb. We observed two strategies for the identification of the expression which combines with a predicate to establish a proposition (the immediate argument daughter of a node of type *t*), namely the ergative *=ne* and verbal morphology in all other cases. The system makes sure that the subject is disambiguated either through case marking early in the derivation process (with the ergative *=ne* in the case of a perfective, transitive clause) or at the finishing stages via verbal morphology. With this observation in mind, what was shown here is building the 'external' argument node is tightly linked to the parse of information about the event described and its temporal and aspectual organisation. This can happen as early as the parse of the ergative *=ne* (reflecting the fact that the marker surfaces only in finite clauses) or at the finishing stages of the derivation with the parse of the finite verb. This implies an analysis which treats the perfective transitive verb as unable to project an 'external' argument node, reflecting its historical origin.

6 The expression of focus: structure building in context

6.1 Introduction

In previous chapters I have presented first attempts at capturing particularities of Hindi clause structure from the perspective of Dynamic Syntax. This chapter is dedicated to the expression of focus and develops an analysis which reflects the stepwise way in which an open proposition is derived and the point in the interpretation process in which focal material provides an 'update' to yield a fully complete propositional formula. As discussed at length in Chapter 2, the approach taken here differs significantly from previous work in that topic and focus are understood as pragmatic notions that describe the relationship utterance material holds with respect to the context but have no formal significance and no role in the formal analysis itself. This is in line with the arguments developed in previous chapters: grammatical functions such as subject and object play no role in the analysis, as well as case labels such as ergative, dative and accusative.[54] Similarly, the notions of topic and focus are not treated as grammatical

[54] Though a fully worked out DS analysis of the ergative pattern and the many uses of the Hindi accusative/dative *=ko* is pending.

categories or features that need to be formally expressed; instead, their expression involves the manipulation of universally available grammatical mechanisms in interaction with language-specific lexical instructions and contextual information.

This chapter shows how new insights can be reached by making a move to a grammar formalism that takes as key for providing syntactic explanations the directional (word-by-word) and contextually informed nature of the parsing and production process. The chapter steps on ideas from the DS literature on ellipsis and split utterance phenomena (Kempson et al., 2015; Kempson, Gregoromichelaki, & Eshghi, 2019; Kempson et al., 2011) where it is argued that interlocutors make use of complete or partial structures as points of departure for their utterance turn. From such a perspective, the notion of focus receives procedural significance: it is a cover term for context-update interpretive effects achieved in the process of interpretation build-up. This can be an 'update' made by providing a value to an open proposition (question-answer pairs), an 'update' to some propositional structure already construed in the context (corrections) or an 'update' made relative to some partial structure in the immediate context (such as topic-focus sequences).

In what follows, Section 6.2 revisits in brief the notion of 'default' or routinised structure building, first mentioned in Chapter 5, and argues that it takes place in the case of wide focus utterances. Section 6.3 proposes a formulisation of left and right periphery phenomena and effects associated with post-posing and preposing information with differing information status. Section 6.4 discusses 'new' information focus in the case of question-answer pairs: it models fragmented answers to a *wh*- question as providing directly a value to an open proposition yielded by the question. Finally, Section 6.5 draws a conclusion and summarises the main points.

6.2 'Basic' word order and default structure-building

Traditionally in the typological literature languages are ascribed a 'basic' word order (also referred to as the 'canonical' word order) that has to do with the ordering of the subject, the object and the verb that is considered most pragmatically 'neutral' (Lambrecht, 1994; Newmeyer, 2003). For Hindi, this is widely accepted to be the SOV word order, although in discourse any word order is possible. Broad focus or all-new utterances are usually taken as an indication for a language's basic word order. For example, a question such as *Kyaa huaa* 'What happened?', as in (400), is expected to yield a response in which neither part is presupposed and follows basic SOV word order (though this is idealised and the situational context is hard to 'control' during data collection):

(400) A sees stopped cars on the street and asks B who is standing nearby:

A: kyaa huaa
what be.PFV.M.SG
'What happened?'

B: bas=ne gaaRii t^hok dii
bus.M=ERG car.F thump give.PFV.F
'The bus hit a/the car.' (elicited)

The so-called word order 'freezing' phenomena (Lee, 2001; Mohanan, 1994), discussed in Chapter 5, are another indication of a strongly preferred SOV word order. While Hindi allows word order flexibility, the examples in (401)-(402) (repeated from (105)-(106)) indicate a 'freeze' in word order possibilities. As per Mohanan (1994), this is because in the case of 'equal' animacy and identical gender, word order takes precedence allowing only an interpretation in which the initial NP is the subject and the preverbal NP is the object:

(401) patt^{h}ar botal toR-egaa
stone.M bottle.M break-FUT.M.SG
(i) 'The stone will break the bottle.'
(ii) *'The bottle will break the stone.' (Mohanan 1992 via Lee 2001: 14)

(402) botal patt^{h}ar toR-egaa
bottle.M stone.M break-FUT.M.SG
(i) 'The bottle will break the stone.'
(ii) *'The stone will break the bottle.' (Mohanan 1992 via Lee 2001: 14)

Gambhir (1981) makes the same observation and shows this with the examples in (403) (repeated from (386)) and (404), although some of my consultants expressed a strong preference for the realisation of *=ko* on the object. In (403) *gaay* 'cow' precedes *b^{h}aiNs* 'buffalo' and the only possible interpretation is one in which a cow is licking a buffalo. In (404), this is reversed: *b^{h}aiNs* precedes *gaay* which results in a reading in which a buffalo is licking a cow.

(403) dek^{h}-o dek^{h}-o, **gaay** **b^{h}aiNs** caaT rah-ii hai
look-IMP look-IMP cow.F buffalo.F lick PROG-F be.PRS.3SG
'Look, look, a cow is licking a buffalo' (Gambhir, 1981: 282)

(404) dek^{h}o dek^{h}o, **b^{h}aaiNs** **gaay** caaT rah-ii hai
look-IMP look-IMP buffalo.F cow.F lick PROG-F be.PRS.3SG
'Look, look, a buffalo is licking a cow.' (Gambhir, 1981: 282)

The examples by Gambhir (1981) in (403)-(404) show 'out-of-the-blue' or 'all-new' utterances in which neither part of the proposition is presupposed in prior discourse. Lambrecht (1994) refers to such data as sentence-focus structures which differ from topic-comment structures in the absence of a topic relation between the topic argument and the proposition. Thus, utterances such as (403) or (404) have an event-reporting function, rather than providing information about a presupposed entity (a topic).

The difference between a topic-comment structure and a wide focus (or sentence-focus) structure is shown in (405)-(406):

(405) Question-answer pair: subject focus

(a) mach^{h}lii kaun k^{h}aa-t-aa hai
fish.F who eat-IMPF-M.SG be.PRES.3SG
'Who eats fish?'

(b) mach^{h}lii [billii]$_{F}$ k^{h}aa-t-ii hai O[S]$_{F}$V
fish.F cat.F eat-IMPF-F be.PRES.3SG
'The cat eats fish.'/'Cats eat fish.'

(406) Wide focus:

(a) kyaa ho rah-aa hai
what be PROG-.M.SG be.PRS.3SG
'What is happening/going on?'

(b) #mach^{h}lii billii k^{h}aa rah-ii hai
fish.F cat.F eat PROG-F be.PRES.3SG
#'The fish is eating a cat/cats.'

(c) billii mach^{h}lii k^{h}aa rah-ii hai
cat.F fish.F eat PROG-F be.PRES.3SG
'The cat is eating fish.'

In (405), the question in (a) acts as a departure for the parse of the answer in (b). The question yields the open proposition 'x eats fish' indicating the speaker's request for filling an informational gap. In B's reply the initial topic *mach^{h}lii* 'fish' acts as an anchor for the assertion 'x = billii', i.e. an informational update is made relative to some propositional structure from the context (see Section 6.4 for modelling question-answer pairs). In (406), as a response to a wide focus question a word order such as OSV in (b) is dispreferred; instead the parser defaults to the 'canonical' SOV word order as neither of the arguments is presupposed. In fact, as a response to the question in (406)(a), (b) leads to a reading in which a fish is eating a cat.

To account for these observations, I proposed in Chapter 5 that Hindi's basic word order reflects a routinised path for local structure building. In the absence of any contextual, prosodic and/or morphological clues to indicate otherwise, the parser defaults to an SOV reading. This

means that the first expression is interpreted as the subject of predication, as in (403)-(404) and (406)(c). I hypothesise that default SOV word order is the result of routinised update; the expression closer to the verb joins the predication by default in the absence of any clues to indicate otherwise. In what follows I elaborate on pragmatically motivated deviations from SOV structures and show how these can be captured by using DS concepts of underspecification and update.

6.3 Effects of preposing and postposing

6.3.1 The left periphery: LINK and *ADJUNCTION

Left periphery effects are captured in DS in terms of the availability of distinct computational rules at the onset of a parse, namely the rules of *ADJUNCTION and LINK ADJUNCTION (first introduced in Chapter 3). To illustrate with English examples, consider the structures in (407)-(408). Topicalization in (407) involves the building of an unfixed node via *ADJUNCTION at the onset for the parse of the initial NP. For the left-dislocated structure in (408) the initial NP is parsed onto a LINKed structure which provides an immediate context for the pronoun *her* to find a contentful formula. Figures 4 and 5 shows the two structures that emerge.

(407) Alice, Bill likes. → **Topicalization** – initial NP associated with delayed update
(It's John that he hates.)

(408) Alice, Bill likes her. → **Left-dislocation** – anaphoric relation between initial NP and rest of proposition

Figure 5 Topicalisation

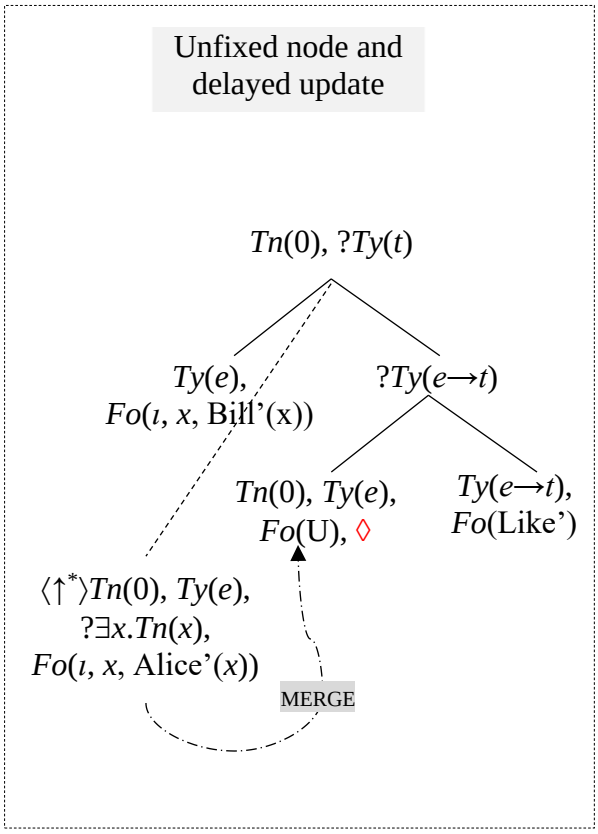
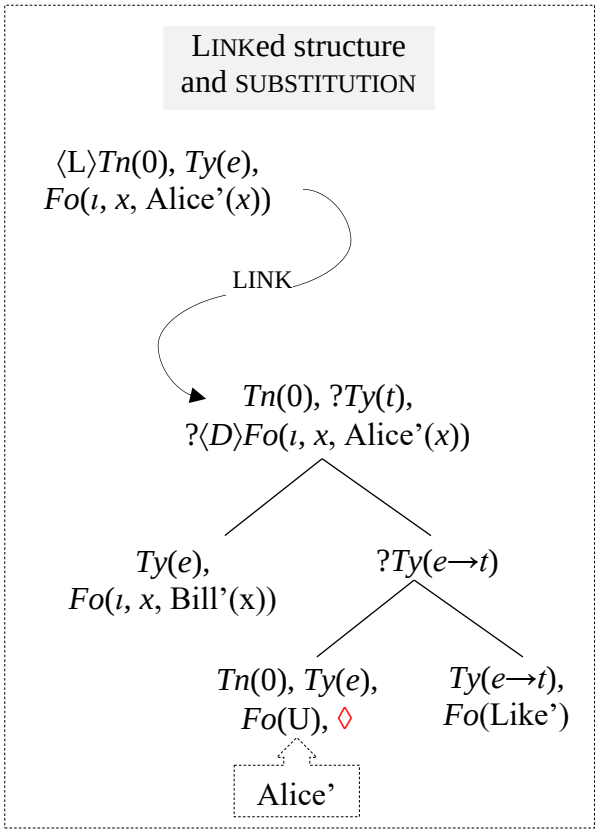


Figure 4 Left-dislocation



The structure in Figure 4 shows a snapshot of the derivation for (407). The displaced object is parsed on an unfixed node built via *ADJUNCTION and the subject *Bill* is parsed onto a locally unfixed node. The finite verb *likes* projects a full propositional template and ensures that it is exactly the locally unfixed node that is parsed as the subject as it scans the partial tree and imposes such a requirement only on a locally unfixed node (see Cann (2011) for the details). The outstanding unfixed node carrying the expression *Alice'* can then find a structural update via MERGE with the object node. This is shown in Figure 4.

For (408), the parse starts with the building of a LINKed structure at which the initial NP is parsed. Then, the pointer returns to the main tree and proceeds with the parse of the subject *Bill* on a locally unfixed node. As usual the verb projects a propositional template with a fixed 'external' and 'internal' argument nodes. This allows the parse of the object *her* at the

internal argument node and provides a fixed tree node address for the locally unfixed node carrying the subject expression *Bill'*. The object *her* finds a contentful formula value via SUBSTITUTION from the context; in this case the linked structure, as shown in Figure 5.

The availability of alternative strategies at the onset of a parse reflects the wide range of discourse functions that the left periphery can perform. The same mechanisms are available for the parse of left-peripheral expressions in Hindi coinciding with different interpretive effects. Similarly to the English examples above, the structures in (409) and (410) (repeated from (210) and (290)) involve the construction of a LINKed structure and an unfixed node built via *ADJUNCTION, respectively (see Chapter 4 for a detailed discussion on these examples).

(409) kitaab anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading the book.'

(410) KITAAB anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading a book (not a newspaper).' (Dayal, 2008: 80)

Motivation for the existence of these two distinct mechanisms for an analysis of the Hindi left periphery also comes from long-distance phenomena. Dwivedi (1994) differentiates between topicalization (411) and left-dislocation (412) where only the former involves a gap and the second shows a coreferential accusative pronoun in the complement clause:[55]

[55] Constructions such as (411) and (412) are not easily replicated in elicitation sessions and were not accepted by my consultants. For this reason, I will not present a detailed formal analysis of these constructions. Also, this would necessitate a fully worked out analysis for parsing finite embedded clauses which is pending.

(411) supriya**=ko** sud^{h}a=ne samj^{h}-aa [ki ramesh **e** pyaar
Supriya.F=ACC Sudha.F=ERG understand-PFV.M.SG that Ramesh.M love

karte hai]
does is
'Sudha thinks that Ramesh loves Supriya.' (Dwivedi, 1994: 36)

(412) supriya$_{i}$ sud^{h}a=ne samj^{h}-aa ki ramesh **use**$_{i}$
Supriya.F Sudha.F=ERG understand-PFV.M.SG that Ramesh.m 3SG.ACC

pyaar karte hai
love does is
'Sudha thinks that Ramesh loves Supriya.' (Dwivedi, 1994: 36)

These represent the classic distinction discussed above between parsing a left peripheral expression on an unfixed node via *ADJUNCTION (411) and a LINKed structure (412). The topicalization structure in (411) involves the early realisation of an expression whose structural update is postponed until more information becomes available. The case-marked dislocated expression *supriya=ko* is parsed on an unfixed node via *ADJUNCTION with no restrictions for local update. The *=ko* marker simply specifies that the node is to find such a tree node address that it is the argument daughter of a predicate type node along an unspecified number of functor relations (see Chapter 5). As the parse progresses, the node finds a tree node address within the embedded propositional structure. In contrast, the left-dislocation construction in (412) simply states from the very onset that something "about" the entity will be said. The initial unmarked proper name is parsed onto a LINKed structure and acts as a background against which the structure unfolds. The accusative/dative pronoun *use* in the embedded clause finds a *Fo* value from the LINKed structure via the pragmatic process of SUBSTITUTION. Importantly, both (411) and (412) yield the same truth-conditional content but differ in terms of the steps taken to derive it.

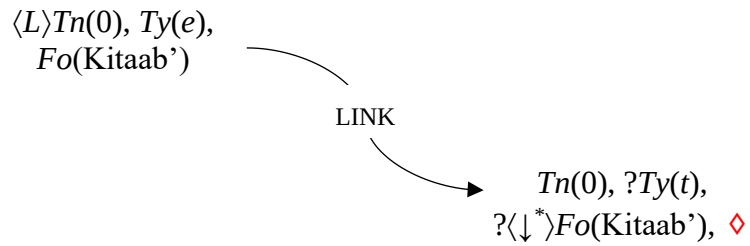
I leave a full formal analysis of embedded clauses for future work. In what follows I turn to simple clauses again, Section 6.3.1.1 discusses topic-focus sequences and Section 6.3.1.2 turns to the expression of contrast in the clause initial position.

6.3.1.1 Topics-focus structures

As discussed first in Chapter 4, left-peripheral topical material such as *kitaab* 'book 'in (413) (repeated from (210)) is parsed on a LINKed structure built with the rule of TOPIC STRUCTURE INTRODUCTION (see Section 3.4.2.7 for an introduction to the rule). The rule builds a LINKed structure from a type-*t*-requiring node, moves the pointer there and decorates it with a requirement for type *e*. The utterance-initial *kitaab* is parsed onto it, satisfying the requirement for an expression of type e, as shown in (414). The transition back to the type-*t*-requiring node induces the ⟨*D*⟩Fo(Kitaab') requirement which states that the two parallel structures share semantic content. Informally, this reflects the intuition that the rest of the utterance will provide more information about the initial entity.

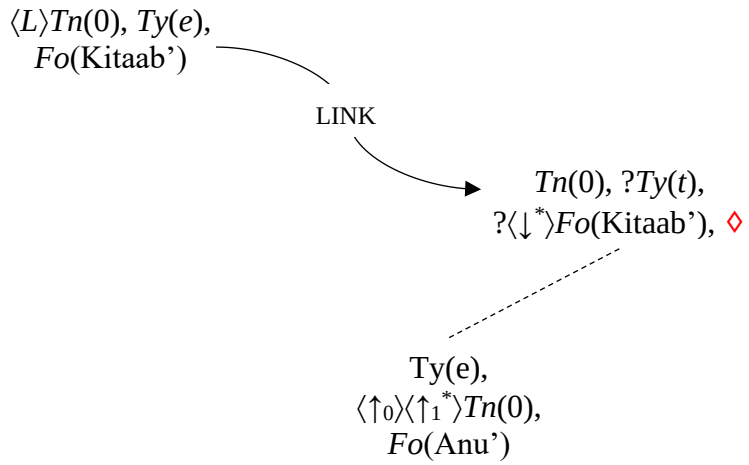
(413) kitaab anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading the book.'

(414) Parsing *kitaab* on a LINKed structure



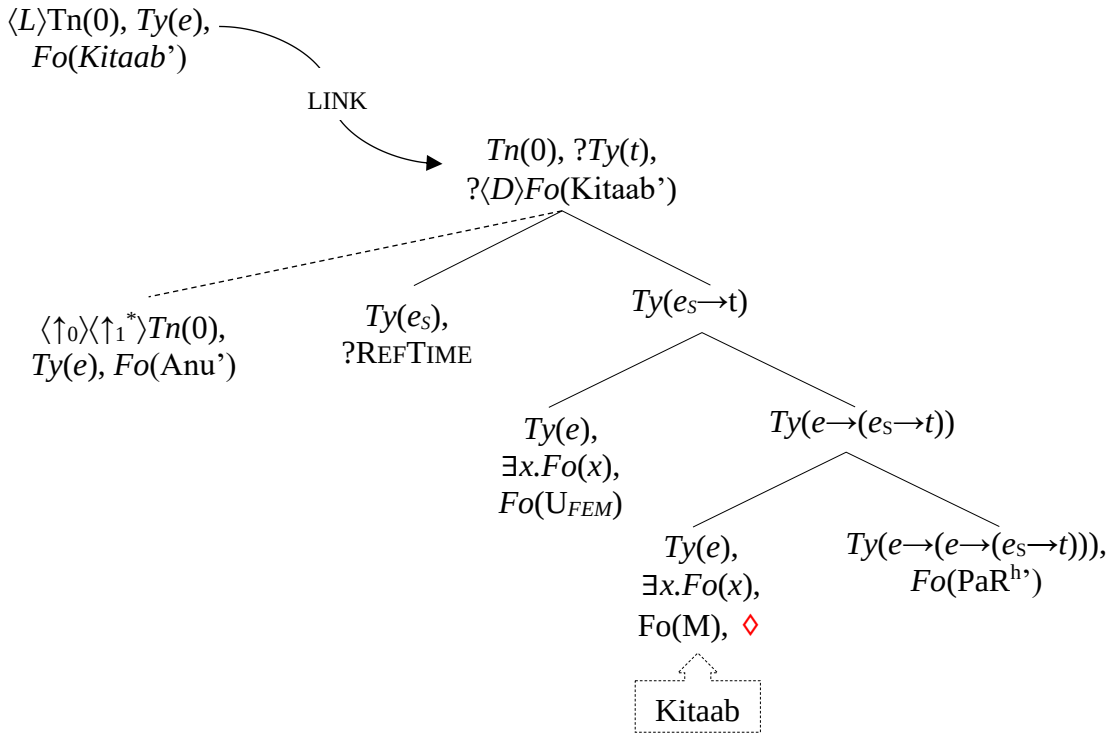
The pointer is now at the right place for the parse to proceed with the building of a locally unfixed node for the parse of *anu*, as shown in (415):

(415) Parsing *anu*



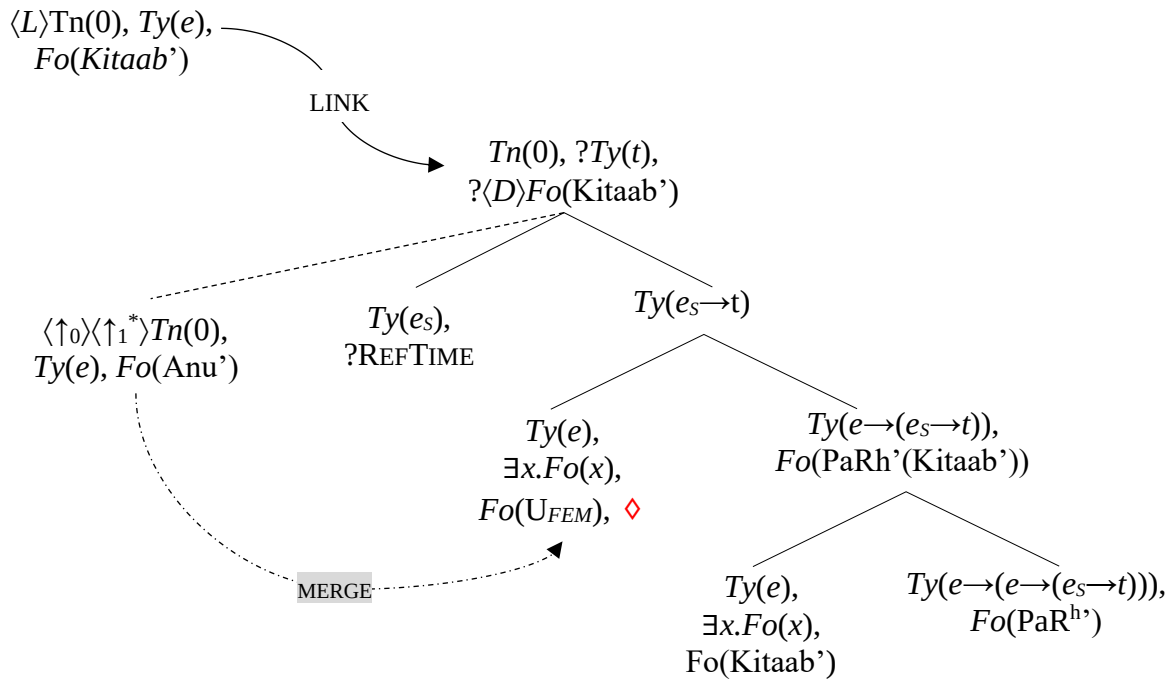
The parse proceeds with the verb projecting a full propositional template, leaving the pointer at the object node. Next, a value for the object node is found via SUBSTITUTION with information from the LINKed structure, as shown in (416). This ensures that the two parallel structure are anaphorically linked and share a formula value.

(416) Parsing *kitaab anu paR^{h} rahii*: SUBSTITUTION



Upon the completion of the object node, the parser moves upwards compiling information as it goes and ends up at the subject node via ANTICIPATION. The structure in (417) shows the point in which an open proposition of the form 'x is reading the book' is derived and alternatives are entertained (see Marten, 2007). The locally unfixed node carrying the subject expression merges with the fixed 'external' argument node and asserts that 'x = Anu'. The completion of the subject node allows the pointer to compile all information at the top node and yield a truth-conditional formula. The rules of SUBSTITUTION and MERGE are two different strategies for some node to find a formula value and constitute the topic and focus effect, respectively.

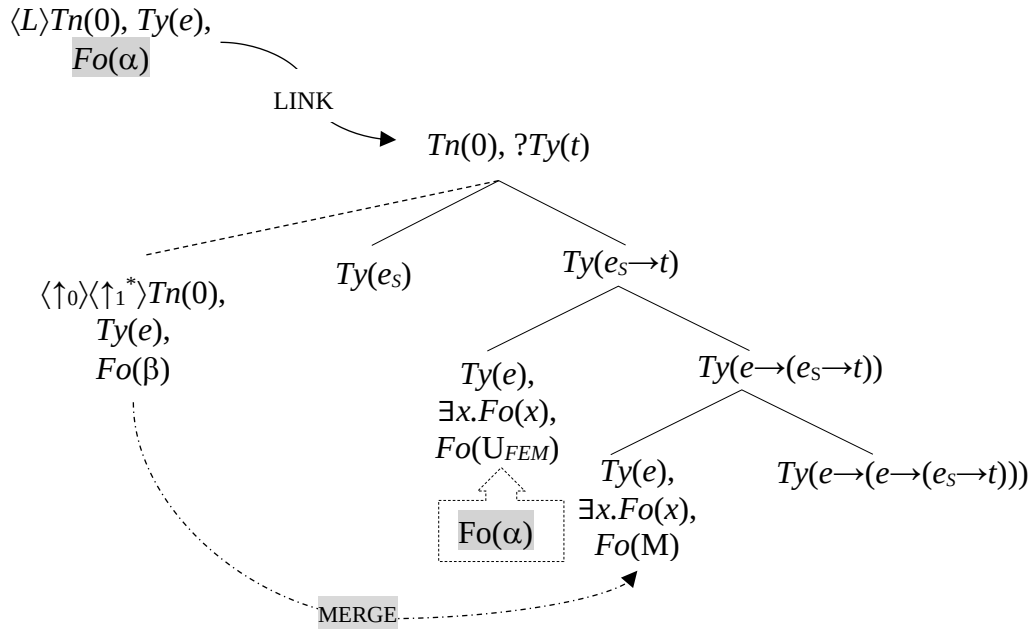
(417) Parsing *kitaab anu paR^{h} rahii*: MERGE



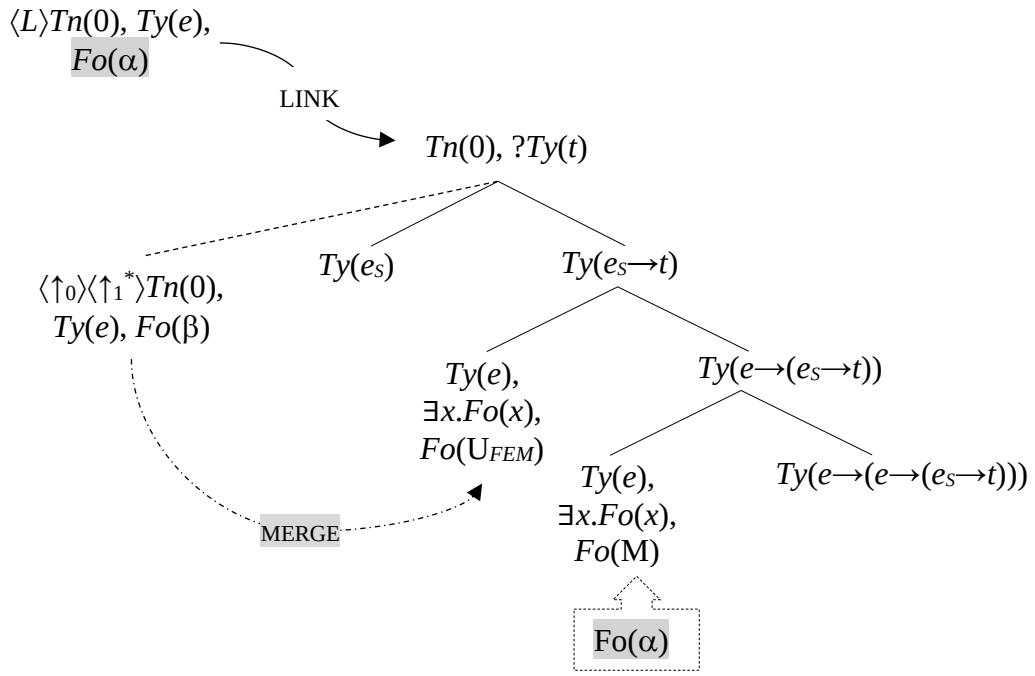
The parse of initial topical subjects follows the same steps, with the difference that the subject is parsed on a LINKed structure and the object is parsed on a locally unfixed node. The two options for an initial subject and object parsed on a LINKed structure are sketched in (418)-

(419), respectively. This shows that at the time of parsing an initial expression, its precise role in the propositional structure might not be clear; any of the argument nodes can find a value via SUBSTITUTION from the LINKed structure. Similarly, a locally unfixed node can merge with either of the argument nodes within the local propositional domain.

(418) Subject topic + object focus



(419) Object topic + subject focus



Of course, this is not to argue that the hearer has to deal with such ambiguity and structural choices all the time as possibilities for different word orders have to do with the immediate discourse context. For example, the question in (420)(a) 'Who eats fish?' (in OSV word order) sets the context against which the answer in (420)(b) is interpreted. In both the question and the answer the object is fronted as the background against which an open proposition is derived. In (420)(b) the answer re-uses the same parsing sequences to provide an update to the presupposed open proposition. In (421)(a) the question asks 'What does a fish eat?' (in SOV order) where the clause-initial NP *machhlii* 'fish' is the subject. In the context of this question, the sequence in (421)(b) reads as SOV following the same word order as the question. It is marked as 'odd' (with the symbol #) as in this context it reads as the very unlikely scenario of a fish eating a cat/cats (unless intended).

(420) Subject focus

(a) mach^{h}lii kaun k^{h}aa-t-aa hai
fish.F who eat-IMPF-M.SG be.PRES.3SG
'Who eats fish?'

(b) machhlii billii k^{h}aa-t-ii hai
fish.F cat.F eat-IMPF-F be.PRES.3SG
'Fish, cats eat.'

(421) Object focus

(a) mach^{h}lii kya k^{h}aa-t-ii hai
fish.F what eat-IMPF-F be.PRS.3SG
'What does the fish eat?'

(b) #mach^{h}lii billii k^{h}aa-t-ii hai
fish.F cat.F eat-IMPF-F be.PRES.3SG
'The fish eats cats.'

This section has shown that topic-focus sequences can be captured in DS as involving the projection of a parallel structure at the onset that is in an anaphoric relation to the main propositional tree. Informally, the proposed analysis captures the 'aboutness' relation between an initial topic and the rest of the utterance. LINKed structures have a context-setting function relative to which the comment part of an utterance is parsed. In the main tree, focal material is parsed onto a locally unfixed node whose structural update at the finishing stages of the derivation provides the missing value of an open proposition.

6.3.1.2 Contrast and *ADJUNCTION

In Chapter 4 I proposed that stressed initial NPs, as in (422) and (423), are parsed on an unfixed node built via the rule of *ADJUNCTION. From a DS perspective, stress on the initial argument can be understood as a clue to the human parser for a deviation from routinised local structure building (for example, in the case of all-new utterances) and topic-comment structures which

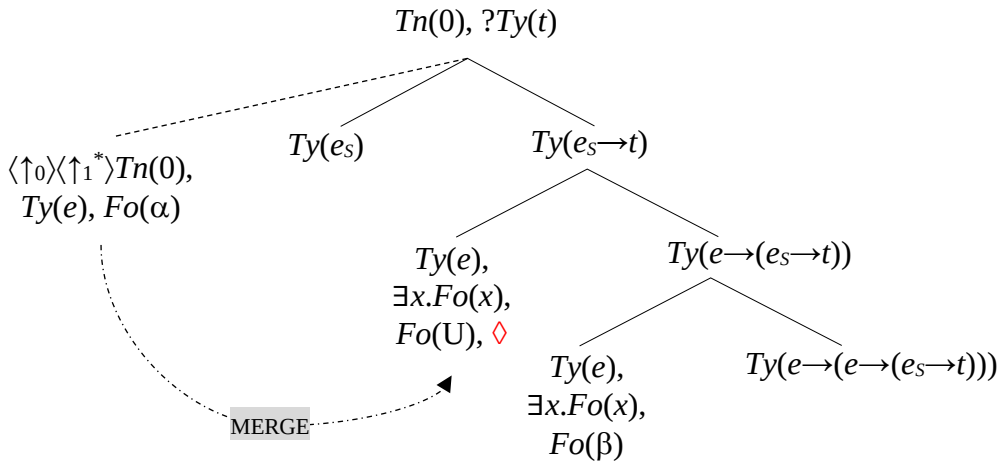
involve the building of a LINKed structure at the onset. An analysis involving the construction of an unfixed node captures the intuition that an initial stressed NP constitutes 'highlighted' material. Parsing an NP on an unfixed node does not encode discourse status; what is achieved is the isolation of some expression by delaying its structural update.

The analysis for both a stressed subject (422) and a stressed object (423) (repeated from (196) and (212), respectively) will follow the same steps; the only difference is the point of MERGE. The unfixed node carrying *aurat* 'woman' in (422) will MERGE with the 'external' argument node, whereas the unfixed node carrying *kitaab* 'book' will merge with the 'internal' argument node. These different MERGE points are sketched in (424) and (425). In both sketches we observe the point at which an open proposition is derived and updated with information from the unfixed node; in (424) the unfixed node provides a value for the 'external' node and in (425) – for the 'internal' node (see Chapter 4 for a detailed discussion which I will not repeat here).

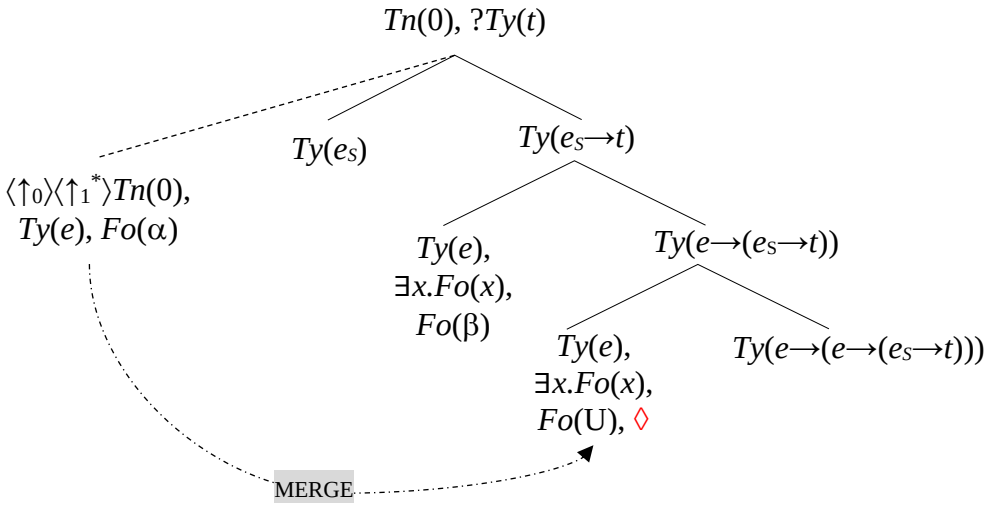
(422) AURAT Daak laa rah-ii hai
woman mail bring PROG-F be.PRS.3SG
'It's a woman who's bringing the mail.' (Dayal, 2004: 411)

(423) KITAAB anu paR^{h} rah-ii hai
book.F Anu.F read PROG-F be.PRS.3SG
'Anu is reading a book (not a newspaper).' (Dayal, 2008: 80)

(424) Initial contrastive/corrective subject



(425) Initial contrastive/corrective object



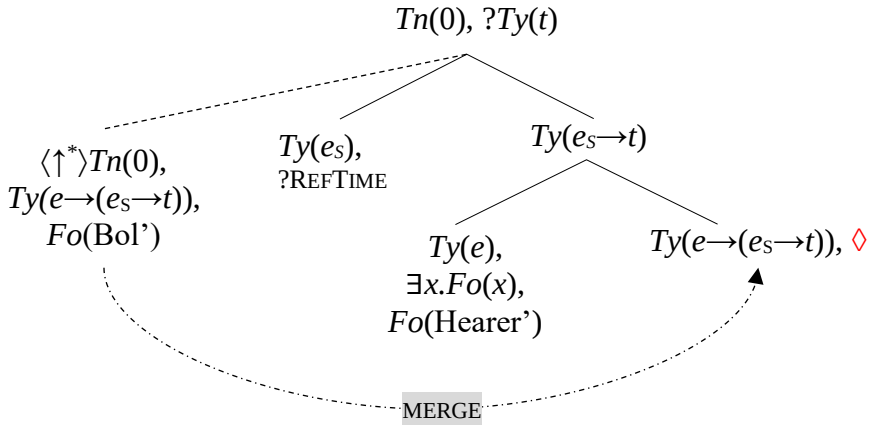
The rule can also be used for the parse of contrastive topics which Krifka (2008) describes as topics which contain focus. The examples in (426)-(427) show contrasted verbal stems (in **bold**) fronted away from auxiliaries. Fronting verbal stems in initial position is a very marked constructions and is typically observed in contrastive contexts.

(426) **k^{h}aa** maiN rah-aa t^{h}-aa aur sukuun minii=ke chehre=par t^{h}-aa
eat 1SG PROG-M.SG be.PST-M.SG and relief.M Mini=GEN.M.OBL face=on be.PST-M.SG
'I was eating and satisfaction was on Mini's face.' (extract from *PahaaR aur mera jivaan*[56])

(427) **bol** tum rah-ii t^{h}-ii aur **sun** maiN rah-aa t^{h}-aa
speak 2PL PROG-F be.PST-F and listen 1SG PROG-M be.PST.M
'You were speaking, and I was listening.' (elicited)

With all the tools we have at our disposal an analysis for fronted verbal elements is straightforward. The parse for (427) will start with the projection of an unfixed node of a predicate type via the rule of PREDICATE *ADJUNCTION (see Chapter 3, Section 3.4.2.6) to allow the parse of the verbal stem *bol'* 'speak'. The parse proceeds as usual. The subject is parsed onto a locally unfixed node which finds a tree node address after the progressive auxiliary *rah-ii* builds a fixed 'subject' type *e* node and a fixed type $e \rightarrow (e_S \rightarrow t)$ node. Then the unfixed node carrying the formula *Bol'* merges with the fixed node of type $e \rightarrow (e_S \rightarrow t)$, as shown in (428).

(428) Predicate *adjunction at the onset



Finally, the past tense auxiliary *t^{h}ii* projects information about the temporal organisation of the event and triggers the compilation of semantic content at the top node. The conjunction *aur*

[56] See Appendix A for a list of written data sources.

builds a parallel LINKed structure of type *t* at which the second clause conjunct is parsed following the same sequence of parsing actions. A detailed representation of how parallel structures are built is left for another occasion.

This section has argued that the expression of both left-peripheral contrastive foci and contrastive topics is captured in similar terms as involving a parsing mechanism which isolates the contrastive material from the rest of the utterance and delays its structural update. Left-peripheral contrastive material is parsed on an unfixed node built via the computational rule of *ADJUNCTION. Such an approach reflects Krifka's (2008: 268) observation that contrastive topics share a similarity with foci, namely they both indicate the presence of alternatives. The effect of *ADJUNCTION is that it allows temporary retainment in memory of the parsed expression, while the rest of the utterance yields a proposition with some aspect of it missing (i.e. an 'open' proposition in semantic approaches to focus). In other words, there is a point in the parsing sequence, immediately prior to determining the tree node address of the unfixed node, in which alternatives for the missing part of a proposition are entertained (see also Marten, 2007).

6.3.2 The right periphery: emphasis vs. de-emphasis

Despite being a head-final language, Hindi easily allows material to be realised in the postverbal position. Gambhir (1981) explains that NPs can be realised postverbally for emphasis or de-emphasis, depending on the discourse status of postponed material. This was discussed extensively in Chapter 2, Section 2.5 where I argued that the diversity of pragmatic effects associated with postponing material to the right of the verb can be explained once we take into account the directionality of the parsing/production process and the role of the context. Here, I present the details of the formal analysis making use of the tools of Dynamic Syntax.

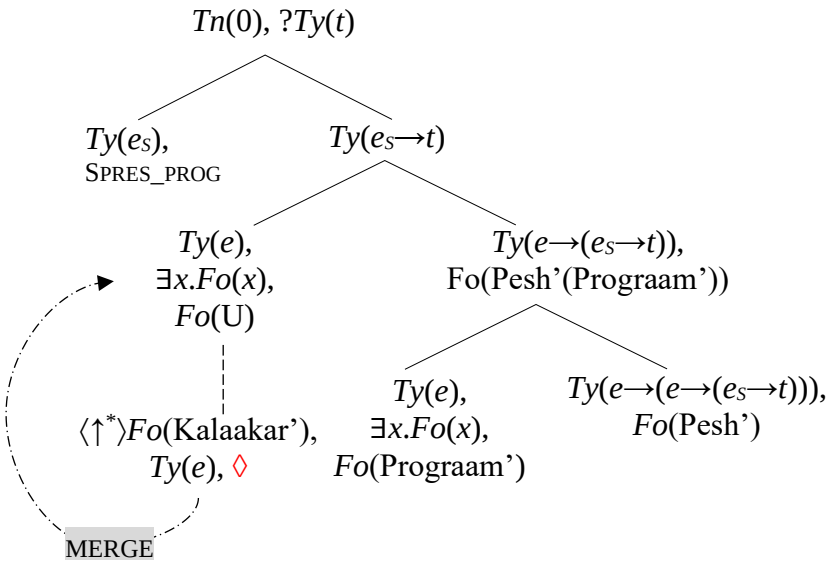
Left-peripheral expressions are parsed in the context of some very minimal tree structure, whereas material postponed to the right of the verb is parsed in the context of an already existing, fixed structure. This is because the finite verb unfolds a propositional template with type-complete argument nodes. To account for right periphery effects in Hindi we need the rule of LATE *ADJUNCTION (see Chapter 3, Section 3.4.2.6) which builds an unfixed node from a type-complete node of the same type as the node from which it is projected.

To take the example in (429) (repeated from (24)), after the verb and auxiliaries have projected their contribution the parse cannot be completed as usual because the formula value of the subject is missing. At this point an open proposition of the form 'x is presenting today's programme' is derived and the parser 'waits' for further information. As Gambhir (1981) explains, discourse-new material can be realised postverbally for emphasis, to create suspense or to make an announcement among other uses (see Chapter 2). The pointer moves to the type-complete subject node via ANTICIPATION and builds from there an unfixed node of type *e* via the rule of LATE *ADJUNCTION for the parse of the postponed NP *ek bahut mashoor kalaakar* 'a very famous artist'. The structure in (430) shows the point at which the subject node finds a value from the unfixed node via MERGE.

(429) aaj=kaa programm pesh kar rah-e haiN **ek** **bahut**
today=GEN.SG.M programme.M present do PROG-PL.M be.PRS.PL one very

mashoor kalaakaar
famous artist.M
'A very famous artist is presenting today's programme.' (Dayal, 2003: 89; adapted glossing)

(430) Parsing *ek bahut mashoor kalaakar*

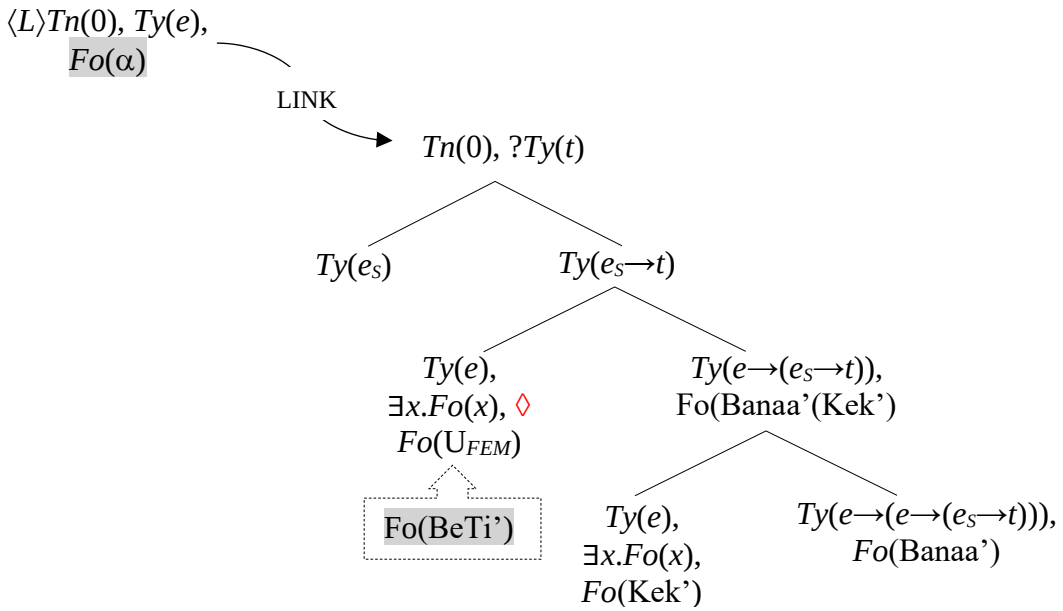


The situation in (431) is different as what is postposed in B's utterance is information that can be retrieved from the context. The parse of B's utterance starts with the building of a locally unfixed node at which the object *ye kek* projects its specifications. The parse proceeds as normal with the parse of the verb which allows the locally unfixed node to find a tree node address. The same effect as in (429) is not achieved as a fully complete propositional structure can be completed after the parse of the present tense auxiliary *hai.* This is illustrated in (432) where the subject node finds a *Fo* value from the context via SUBSTITUTION. The clause-final subject simply reinforces the topic relative to which an information update is made.

(431) A: tumhaarii beTii=ne kya banaa-yaa hai
2PL.POSS.F daughter.F=ERG what make-PFV.M be.PRS.3SG
'What has your daughter made?'

B: ye kek banaa-yaa hai (meerii beTii=ne / us=ne)
this cake.M make-PFV.M.SG be.PRS.3SG 1SG.POSS.F daughter.F=ERG 3SG.PROX.OBL=ERG
'My daughter/she has made this cake.'

(432) Parsing *ye kek banaayaa hai* and SUBSTITUTION



As the 'subject' node is already completed with information from the context, any contribution from postposed material simply collapses with already existing structure, further reinforcing the given topic. Such an analysis allows explaining right periphery interpretive effects as arising directly from the interplay between structure building mechanisms and information from the context.

6.4 Question-answer pairs: new-information focus

The expression of focus involves an update to a presupposed proposition. This is most obvious in question-answer pairs, as in (433) (repeated from (192)), where the question in (a) acts as a context for the parse of the fragment answer in (b):

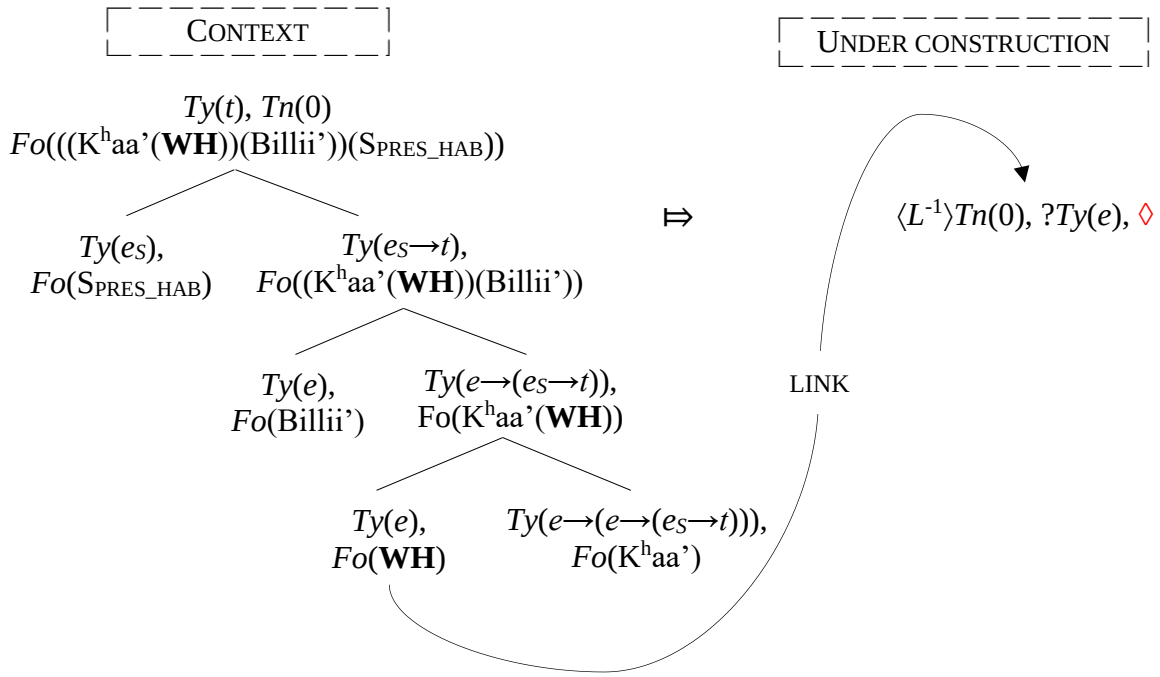
(433) Question-answer pair:

(a) billii kyaa k^{h}aa-t-ii hai
cat.F what eat-IMPF-F be.PRS.3SG
'What does the cat eat?'

(b) mach^{h}lii
fish.F
'Fish.'

The question in (433)(a) yields the open proposition *Fo*(((K^{h}aa'(**WH**))(Billii'))(S$_{PRES_HAB}$)) which acts as the context for the parse of the answer, as illustrated in (434). The metavariable WH is projected by the *wh*- question word and allows not rendering the parse incomplete (as, for example, metavariables projected by pronouns which need to find a value from the context, otherwise the parse cannot be completed). Further, I hypothesise that the presence of such a metavariable in the structure licences the move of the pointer to its node in anticipation for informational update. Then, the hearer departs from the structure projected by the question, as illustrated in (434), with the building of a LINKed structure of type *e* from the node carrying the **WH** metavariable.

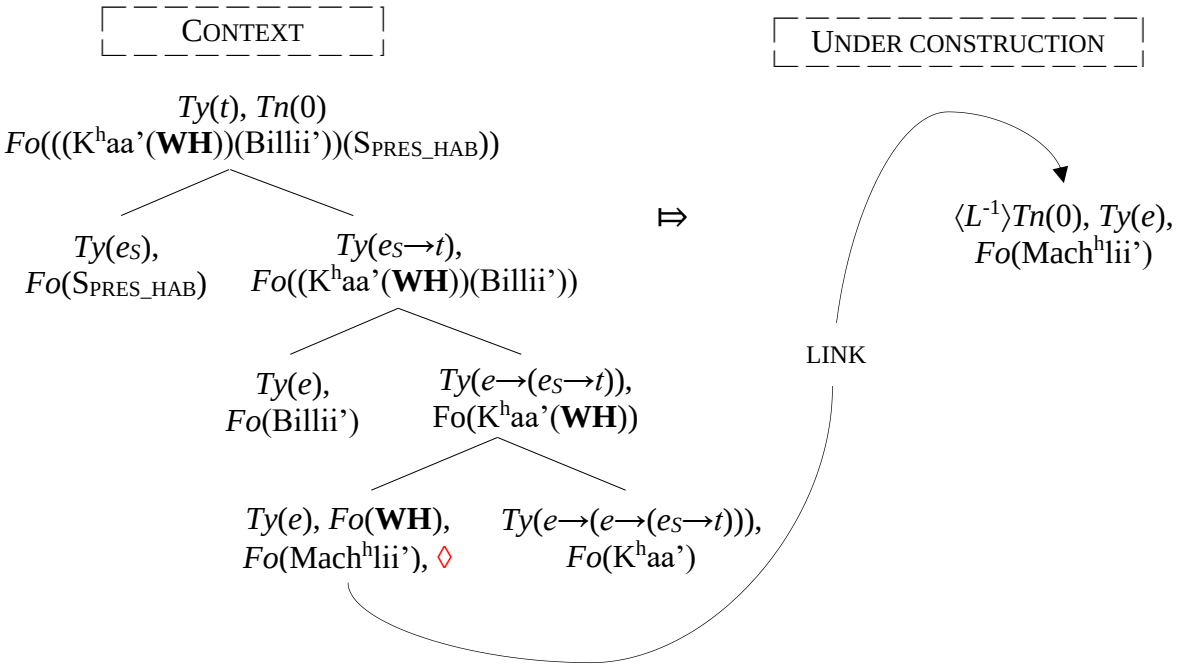
(434) Parsing *mach^{h}lii* 'fish': building a LINKed structure



Next, the fragment answer *mach^{h}lii* 'fish' can be parsed. The lexical entry for *mach^{h}lii* instructs the pointer to decorate the node with type and formula values as usual. The two formula

decorations, WH and Mach^{h}lii, are then evaluated as the same term, i.e. they are evaluated as referring to the same entity, as shown in (435):

(435) Parsing *mach^{h}lii* 'fish': projecting lexical information and evaluation



The effect of the fragment answer is one of update made relative to an open proposition from the context. The LINK relation expresses exactly this departure from some contextually available structure.

6.5 Conclusion

This chapter presented a Dynamic Syntax analysis of topic-focus sequences, the expression of contrast in the left periphery, preposing and postposing material in the right periphery and fragmented answers to *wh*- questions. The discussion builds on insights from the semantic literature on focus but formulates an analysis in procedural terms. It shows that by adopting a procedural grammar architecture, we can model the stepwise way in which focal material

provides an update to an open proposition. It argues that the expression of focus involves the manipulation of universally available grammatical mechanisms in interaction with contextual information. Importantly, focus is not treated as a grammatical category or primitive that needs to be formally expressed; instead it is treated as a cover term for context-update effects in the interpretation process.

7 Conclusion

This thesis set to show that new insights can be reached in linguistic analysis if a procedural grammar architecture is adopted that is built to reflect the parsing/production process. It argues for an approach that takes as key the time-linear, word-by-word manner in which a linguistic string is parsed and produced. The thesis takes first steps towards a Dynamic Syntax analysis of aspects of Hindi clause structure, and in particular – modelling nominal interpretation, the contribution of case markers and verbal morphology in the parsing process. Then, it delves into pragmatically motivated word order variation, looking at question-answer pairs, corrections, topic-focus sequences and interpretive possibilities in the left and right peripheries.

This thesis represents a first attempt at capturing particularities of Hindi clause structure from a theoretical perspective that takes the directionality of the language comprehension process as the basis for providing syntactic explanations. The type of analysis argued for here differs significantly from other theoretical works on Hindi and closely related Urdu in several respects. First, it does not share the view that syntactic explanations can be provided based on complete sentences and static representations of constituent structure. Rather, the syntactic process is dynamic; it is represented as the incremental accumulation of semantic content on a word-by-word basis relative to the context. This allows an analysis of information structural phenomena which concentrates on *how* a propositional structure is derived, rather than identifying movement triggers or defining an independent level of information structure. The

second key difference is that the construction process is sensitive to the context. Given the procedural nature of the interpretation process, the model allows for contextual information to be implemented at any stage of the derivation. Third, DS provides a way of modelling information exchange in real-time. Insights from DS work on ellipsis and split utterances (Cann et al, 2007; Purver et al. 2006) show that language production is sensitive to the immediate context and speakers can recover meaning or re-use parsing actions. This has an interesting consequence for the study of focus phenomena; it allows modelling the expression of focus as strategies for informational update relative to what is immediately contextually available. This allows simplifying to a large extent the syntactic machinery needed to account for pragmatically motivated deviations from 'basic' word order.

The novelty of the proposed analysis lies in the fact that pragmatic notions such as focus have no formal significance in the analysis; I use focus simply as a descriptive notion that defines the relationship some utterance material holds with respect to the context. There is, however, no need to define an independent focus category as its expression has to do with the manipulation of universally available grammar mechanisms (such as computational rules for building unfixed nodes and LINKED structures) in interaction with contextual information. From such a perspective, focus stands for context 'update' effects achieved in the interpretation process. This can be an 'update' made by providing a 'missing' value to a presupposed open proposition (e.g. question-answer pairs), an 'update' to some part of a contextually-available proposition (e.g. corrections) or an 'update' made relative to some partial structure in the immediate context (such as topic-focus sequences).

While the thesis makes reference to prosodic cues as informing parsing choices, the role of prosody was largely unaddressed and left for future work. This is an area in need of

further work but the type of analysis argued for here allows incorporating future findings from studies on prosody in a straightforward manner as instructions on how the parse proceeds.

References

Abbi, Anvita, & Gopalakrishnan, Devi. (1991). Semantics of explicator compound verbs in south Asian languages. *Language Sciences, 13*(2), 161-180.

Aboh, Enoch Oladé. (2007). Focused versus non-focused wh-phrases. In E. O. Aboh, K. Hartmann & M. Zimmermann (Eds.), *Focus Strategies in African Languages: The Interaction of Focus and Grammar in Niger-Congo and Afro-Asiatic* (pp. 287-314). Berlin, Boston: De Gruyter Mouton.

Ahmed, Tafseer. (2006). Spatial, Temporal and Structural Usages of Urdu ko. In M. Butt & T. H. King (Eds.), *Proceedings of the LFG06 Conference*: CSLI Publications.

Ahmed, Tafseer. (2010). Unaccusative/unergative distinction in Urdu. *Journal of South Asian Linguistics, 3*(1).

Aissen, Judith. (2003). Differential Object Marking: Iconicity vs. Economy. *Natural Language & Linguistic Theory, 21*(3), 435-483.

Amberber, Mengistu. (2008). Differential Case Marking of Arguments in Amharic. In A. L. Malchukov & A. Spencer (Eds.), *The Oxford Handbook of Case*. Oxford: Oxford University Press.

Bajaj, Vandana. (2016). *Scaling up Exclusive -Hii.* (PhD Thesis), Rutgers University.

Bashir, Elena. (1999). The Urdu and Hindi ergative postposition ne: Its changing role in the grammar. In R. Singh (Ed.), *The Yearbook of South Asian Languages and Linguistics* (pp. 11-36). New Delhi: Sage publications.

Bhatt, Rajesh. (1994). *The semantics of hi*. Retrieved from: https://people.umass.edu/bhatt/papers/hi.pdf [last accessed: 17 September 2019]

Bhatt, Rajesh. (1997). Matching Effects and the Syntax-Morphology Interface: Evidence from Hindi Correlatives. *MIT Working Papers in Linguistics, 31*, 53-68.

Bhatt, Rajesh. (2003). Topics in the Syntax of the Modern Indo-Aryan Languages: *wh-in-situ* and *wh*-movement. Retrieved from: http://web.mit.edu/rbhatt/www/24.956/wh.pdf [last accessed: 17 September 2019]

Bhatt, Rajesh. (2005). Long Distance Agreement in Hindi-Urdu. *Natural Language and Linguistic Theory, 23*, 757-807.

Bhatt, Rajesh, & Anagnostopoulou, Elena. (1996). Object Shift and Specificity: Evidence from ko-phrases in Hindi. In L. M. Dobrin, K. Singer & L. McNair (Eds.), *Proceedings of CLS 32* (pp. 11-22). Chicago: Chicago Linguistic Society.

Bhatt, Rajesh, & Dayal, Veneeta. (2014). *Polar kyaa*. Paper presented at the Workshop on Non-Canonical Questions and Interface Issues. Retrieved from: http://ling.uni-konstanz.de/pages/conferences/fg-questions/handouts/bhatt-dayal.pdf [last accessed: 17 September 2019]

Bhatt, Rajesh, & Embrick, David. (2017). Causative derivations in Hindi-Urdu. *Indian Linguistics, 78*(1-2), 93-151.

Blackburn, S. , & Meyer-Viol, Wilfried. (1994). Linguistics, logic and finite trees. *Bulletin of Interest Group in Pure and Applied Logics, 2*, 3-29.

Böhm, Stefanie. (2015). Differential object marking in Standard Turkish and Caucasian Urum. In T. Stolz (Ed.), *STUF - Language Typology and Universals* (Vol. 68, pp. 421-438).

Bouzouita, Miriam. (2008). At the Syntax-Pragmatics Interface: Clitics in the History of Spanish. In R. Cooper & R. Kempson (Eds.), *Language in Flux: Dialogue Coordination, Language Variation, Change and Evolution* (pp. 221-263). London: College Publications.

Bresnan, Joan. (2001). *Lexical-Functional Syntax* Oxford: Blackwell.

Bresnan, Joan, & Kanerva, Jonni M. (1989). Locative inversion in Chichewa: A case study of factorization in grammar. *Linguistic Inquiry, 20*, 1-50.

Büring, Daniel. (2009). *Towards a typology of focus realization*: Oxford University Press.

Büring, Daniel. (2015). A theory of second occurrence focus. *Language, Cognition and Neuroscience, 30*(1-2), 73-87. doi: 10.1080/01690965.2013.835433

Butt, Miriam. (1993). Object specificity and agreement in Hindi/Urdu. In G. C. K. Beats, D. Kathman, S. Kita, K. McCullough and D. Testen (Ed.), *Papers from the 29th Regional Meeting of the Chicago Linguistic Society* (Vol. 1, pp. 89-103). Chicago: Chicago Linguistic Society.

Butt, Miriam. (2006). The Dative-Ergative Connection. In O. Bonami & P. C. Hofherr (Eds.), *Empirical Issues in Syntax and Semantics 6* (pp. 69-92).

Butt, Miriam. (2010). The light verb jungle: still hacking away. In B. Baker, M. Harvey & M. Amberber (Eds.), *Complex Predicates: Cross-linguistic Perspectives on Event Structure* (pp. 48-78). Cambridge: Cambridge University Press.

Butt, Miriam. (2014). Questions and Information Structure in Urdu/Hindi. In M. Butt & T. H. King (Eds.), On-Line Proceedings of the LFG14 Conference: CSLI On-line Publications. Retrieved from: https://web.stanford.edu/group/cslipublications/cslipublications/LFG/19/papers/lfg14.pdf. [last accessed: 17 September 2019]

Butt, Miriam. (2017). Hindi/Urdu and Related Languages. In J. Coon, D. Massam & L. M. Travis (Eds.), *The Oxford Handbook of Ergativity* (pp. 807-831). Oxford: Oxford University Press.

Butt, Miriam, & Ahmed, Tafseer. (2007). *Non-Canonical Argument Marking: Beyond Volitionality, Specificity and Animacy*. Paper presented at the Workshop on Case, Word Order and Prominence, Nijmegen.

Butt, Miriam, & Ahmed, Tafseer. (2011). The redevelopment of Indo-Aryan case systems from a lexical semantic perspective. *Morphology, 21*(3), 545-572. doi: 10.1007/s11525-010-9175-0

Butt, Miriam, Farhat, Jabeen, & Bögel, Tina. (2016). Verb Cluster Internal Wh-Phrases in Urdu : Prosody, Syntax and Semantics/Pragmatics. *Linguistic Analysis, 40*(3-4), 445-487.

Butt, Miriam, Grimm, Scott, & Ahmed, Tafseer. (2006). *Dative Subjects*. Paper presented at the NWO/DFG Workshop on Optimal Sentence Processing, Nijmegen. Retrieved from: http://ling.uni-konstanz.de/pages/home/butt/main/papers/nijmegen-hnd.pdf [last accessed: 17 September 2019]

Butt, Miriam, & King, Tracy Holloway. (1991). Semantic case in Urdu. In L. N. Lisa Dobrin, and Rosa M. Rodriguez (Ed.), *Papers from the 27th Regional Meeting of the Chicago Linguistic Society* (pp. 31-45). Chicago: Chicago Linguistic Society.

Butt, Miriam, & King, Tracy Holloway. (1996). Structural Topic and Focus without Movement. In Miriam Butt & T. H. King (Eds.), *Proceedings of the First LFG Conference*: CSLI Publications.

Butt, Miriam, & King, Tracy Holloway. (1997). Null Elements in Discourse Structure. Retrieved from: http://ling.uni-konstanz.de/pages/home/butt/main/papers/nulls97.pdf. [last accessed: 17 September 2019]

Butt, Miriam, & King, Tracy Holloway. (2003). Case systems: Beyond structural distinctions. In E. Brandner & H. Zinsmeister (Eds.), *New Perspectives on Case Theory* (pp. 53-87). Stanford, CA: CSLI Publications.

Butt, Miriam, & King, Tracy Holloway. (2004). The Status of Case. In V. Dayal & A. Mahajan (Eds.), *Clause Structure in South Asian Languages* (pp. 153-198). Berlin: Springer Verlag.

Butt, Miriam, King, Tracy Holloway, & Roth, Sebastian. (2007). Urdu Correlatives: Theoretical and Implementational Issues. In M. Butt & T. H. King (Eds.), *Proceedings of the LFG07 Conference*: CSLI Publications.

Butt, Miriam, & Lahiri, Aditi. (2013). Diachronic pertinacity of light verbs. *Lingua, 135*, 7-29. doi: https://doi.org/10.1016/j.lingua.2012.11.006

Butt, Miriam, & Ramchand, Gillian. (2005). Complex aspectual structure in Hindi/Urdu. In N. Ertischik-Shir & T. Rapoport (Eds.), *The Syntax of Aspect* (pp. 117-153): Oxford University Press.

Butt, Miriam, & Rizvi, Jafar. (2010). Tense and aspect in Urdu. In P. C. Hofherr (Ed.), *Layers of aspect* (pp. 43-66). Stanford, California: Center for the Study of Language and Information.

Cann, Ronnie. (2007). Towards a Dynamic Account of BE in English. In I. Comorovski & K. von Heusinger (Eds.), *Existence: Semantics and Syntax* (pp. 13-48). Dordrecht: Springer Netherlands.

Cann, Ronnie. (2011). Towards an account of the auxiliary system in English: building interpretations incrementally. In R. Kempson, E. Gregoromichelaki & C. Howes (Eds.), *The Dynamics of Lexical Interfaces* (pp. 279-317): CSLI Publications.

Cann, Ronnie. (2018). Peculiar Passives in Dynamic Syntax. Paper presented at the Second Dynamic Syntax conference, University of Edinburgh. Retrieved from: https://docs.google.com/viewera=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxzZWNvbmRkc2NvbmZ8Z3g6NDA0MGRmZjVkMDIyODVjNg [last accessed: 17 September 2019]

Cann, Ronnie, Kempson, Ruth, & Marten, Lutz. (2005). *The Dynamics of Language: An Introduction* (Vol. 35): Elsevier Academic Press.

Cann, Ronnie, Kempson, Ruth, & Otsuka, Masayuki. (2002). On Left and Right Dislocation: A Dynamic Perspective. Retrieved from: https://sas-space.sas.ac.uk/842/1/R_Kempson_Dislocation.pdf [last accessed: 17 September 2019]

Cann, Ronnie, & Miljan, Merilin. (2012). Differential case-marking: Syntactic descriptions and pragmatic explanations. *The Linguistic Review, 29*(4), 585-605. doi: 10.1515/tlr-2012-0021

Carlson, Gregory N. (1977). *Reference to Kinds in English.* (PhD Thesis), University of Massachusetts, Amherst.

Chafe, Wallace L. (1976). *The Caddoan, Iroquoian and Siouan languages* (Vol. 3). The Hague: Mouton.

Chatzikyriakidis, Stergios. (2010). *Clitics in four dialects of Modern Greek: A dynamic account.* (PhD thesis), King's College London.

Chatzikyriakidis, Stergios, & Gibson, Hannah. (2017). The Bantu-Romance-Greek connection revisited: Processing constraints in auxiliary and clitic placement from a cross-linguistic perspective. *Glossa: a journal of general linguistics, 2*(1), 4. 1-39. doi: http://doi.org/10.5334/gjgl.135

Chierchia, Gennaro. (1998). Reference to Kinds across Language. *Natural Language Semantics, 6*(4), 339-405.

Comrie, Bernard. (1981). *Language universals and linguistic typology: Syntax and morphology*. Oxford: Blackwell.

Comrie, Bernard. (2003). When agreement gets trigger-happy. *Transactions of the Philological Society, 101*(2), 313-337. doi: 10.1111/1467-968x.00121

Coon, J., Massam, D., & Travis, L.M. (2017). Introduction. In J. Coon, D. Massam & L. M. Travis (Eds.), *The Oxford Handbook of Ergativity*: Oxford University Press.

Croft, William. (2003). *Typology and universals* (2nd edition ed.). Cambridge: Cambridge University Press.

Dalrymple, Mary, & Nikolaeva, Irina. (2011). *Objects and information structure*. Oxford: Oxford University Press.

Davison, Alice. (1999). Ergativity: Functional and formal issues. In Michael Darnell & E. Moravcsik (Eds.), *Functionalism and Formalism in Linguistics: General papers* (Vol. 1, pp. 177-208). Amsterdam: John Benjamins.

Davison, Alice. (2007). Structural case, lexical case and the verbal projection. In V. Dayal & A. Mahajan (Eds.), *Clause Structure in South Asian Languages*: Springer Netherlands.

Davison, Alice. (2015). Hindi-Urdu: Central Issues in Syntax. In T. Kiss & A. Alexiadou (Eds.), *Handbücher zur Sprach- und Kommunikationswissenschaft / Handbooks of Linguistics and Communication Science (HSK)* . (Vol. 3, pp. 1478-1518). Berlin, Boston: De Gruyter Mouton.

Dayal, Veneeta. (1992). The singular-plural distinction in Hindi generics. *SALT II, OSU Working Papers in Linguistics*.

Dayal, Veneeta. (1999). Bare NP's, Reference to Kinds, and Incorporation. In T. Matthews & D. Strolovitch (Eds.), Proceedings of SALT 9 (pp. 34-51). Ithaca, NY: Cornell University. Retrieved from https://journals.linguisticsociety.org/proceedings/index.php/SALT/article/view/2816.

Dayal, Veneeta. (2004). Number Marking and (In)Definiteness in Kind Terms. *Linguistics and Philosophy, 27*(4), 393-450.

Dayal, Veneeta. (2008). Bare Nominals: Non-Specific and Contrastive Readings under Scrambling. In S. Karimi (Ed.), *Word Order and Scrambling* (pp. 67-90): Blackwell Publishers.

Dayal, Veneeta. (2011). Hindi Pseudo-Incorporation. *Natural Language and Linguistic Theory, 29*(1), 123-167.

Dayal, Veneeta. (2015). Incorporation: Morpho-Syntactic vs. Semantic Considerations *Incorporation: Morpho-Syntactic vs. Semantic Considerations* (pp. 47). Leiden, The Netherlands: Brill.

Dayal, Veneeta. (2017a). *Determining (In)definiteness in the Absence of Articles.* Paper presented at the TripleA 3: Fieldwork Perspectives on the Semantics of African, Asian and Austronesian Languages.

Dayal, Veneeta. (2017b). Does Hindi-Urdu have feature driven wh movement to Spec vP? *Linguistic Inquiry, 48*(1), 159-172.
Dayal, Veneeta. (2018). (In)definiteness without Articles: Diagnosis, Analysis, Implications. In G. Sharma & R. Bhatt (Eds.), *Trends in Hindi Linguistics*. Berlin: Mounton de Gruyter.
de Hoop, Helen. (1992). *Case Configurations and Noun Phrase Interpretation.* (PhD Thesis), Rijksuniversitet Groningen.
de Hoop, Helen, & Narasimhan, B. . (2005). Differential case-marking in Hindi. In M. Amberber & H. d. Hoop (Eds.), *Competition and variation in natural languages: The case for case* (pp. 321-345). Amsterdam: Elsevier.
de Swart, Peter, & de Hoop, Helen. (2007). Semantic aspects of differential object marking. In E. Puig-Waldmüller (Ed.), *Proceedings of Sinn und Bedeutung 11*. Barcelona: Universitat Pompeu Fabra.
Dik, Simon, Hoffmann, Maria E., de Jong, Jan R. , Djiang, Sie Ing, Stroomer, Harry, & de Vries, Lourens (1981). On the Typology of Focus Phenomena. In T. Hoekstra, H. van der Hulst & M. Moortgat (Eds.), *Perspectives on Functional Grammar* (pp. 41-74). Dordrecht: Foris.
Downing, Laura J. (2018). Differential object marking in Chichewa. In I. A. Seržant & A. Witzlack-Makarevich (Eds.), *Diachrony of differential argument marking* (pp. 41–67). Berlin: Language Science Press.
Drubig, Hans Bernhard, & Schaffar, Wolfram. (2001). Focus constructions. In M. Haspelmath, E. König, W. Oesterreicher & W. Raible (Eds.), *Language Typology and Language Universals / Sprachtypologie und sprachliche Universalien / La typologie des langues et les universaux linguistiques. 2. Halbband*: De Gruyter.
Dwivedi, Veneeta. (1994). *Syntactic Dependencies and Relative Phrases in Hindi.* (PhD thesis), University of Massachusetts, Amherst.
É. Kiss, Katalin. (1995). *Discourse Configurational Languages*. Oxford: Oxford University Press.
É. Kiss, Katalin. (1998). Identificational Focus and Information Focus. *Language, 74*. doi: 10.2307/417867
É. Kiss, Katalin. (2016). Discourse Functions: The Case of Hungarian. In C. Féry & S. Ishihara (Eds.). The Oxford Handbook of Information Structure: Oxford University Press.
Egli, Urs, & von Heusinger, Klaus. (1995). The epsilon operator and E-type pronouns. In U. Egli, P. E. Pause, C. Schwarze, A. v. Stechow & G. Wienold (Eds.), *Lexical Knowledge in the Organization of Language* (pp. 121-141): Benjamins.
El Zarka, Dina, & Heidinger, Steffen. (2014). Introduction. In D. El Zarka & S. Heidinger (Eds.), Methodological Issues in the Study of Information StructureGrazer Linguistische Studien (pp. 5-13). Graz: Universitätsbibliothek Graz. Retrieved from: http://unipub.uni-graz.at/download/pdf/1275886?name=Zarka%20Dina%20El%20Heidinger%20Steffen%20Introduction. [last accessed: 17 September 2019]
Enç, Mürvet. (1991). The semantics of specificity. *Linguistic Inquiry*, *22*(1), 1-25.
Erteschik-Shir, Nomi. (2007). *Information structure: The syntax-discourse interface*. Oxford: Oxford University Press.
Faller, Martina. (2002). *Semantics and Pragmatics of Evidentials in Cuzco Quechua* (PhD Thesis), Stanford University, Stanford.

Fanselow, Gisbert, & Féry, Caroline. (2006). Prosodic and Morphosyntactic Aspects of Discontinuous Noun Phrases: a Comparative Perspective. https://user.uni-frankfurt.de/~cfery/publications/Prosodic_and_morphosyntactic_aspects_of_discontinuous_NPs.pdf

Féry, Caroline, & Ishihara, Shinichiro. (2014). *The Oxford Handbook of Information Structure*: Oxford University Press.

Féry, Caroline, & Krifka, Manfred (2008). Information structure: Notional distinctions, ways of expression In P. v. Sterkenburg (Ed.), *Unity and Diversity of Languages* (pp. 123-135). Amsterdam: John Benjamins.

Féry, Caroline, Pandey, Pramod, & Kentner, Gerrit. (2016). The prosody of focus and givenness in Hindi and Indian English. *Studies in Language, 40*(2), 302-339.

Gambhir, Vijay. (1981). *Syntactic Restrictions and Discourse Functions of Word Order in Standard Hindi.* (PhD Thesis), University of Pennsylvania.

Gargett, Andrew. (2011). Incrementality and the Dynamics of Routines in Dialogue. *Dialogue and Discourse, 2*(1), 171-197. doi: doi: 10.5087/dad.2011.108

Gibson, Hannah Cameron. (2012). *Auxiliary placement in Rangi: a dynamic syntax perspective.* (PhD thesis), SOAS, University of London. Retrieved from: https://eprints.soas.ac.uk/16637/ [last accessed: 17 September 2019]

Gibson, Hannah Cameron. (2018). Building meaning in context: A dynamic approach to Bantu clause structure. *Transactions of the Philological Society, 116*(S1), 1-145. doi: doi:10.1111/1467-968X.12136

Gibson, Hannah Cameron, & Marten, Lutz. (2016). Variation and grammaticalisation in Bantu complex verbal constructions: The dynamics of information growth in Swahili, Rangi and siSwati

In L. Nash & P. Samvelian (Eds.), *Approaches to Complex Predicates*: Brill.

Gregoromichelaki, Eleni. (2006). *Conditionals in Dynamic Syntax.* (Phd Thesis), King's College London.

Gregoromichelaki, Eleni. (2011). Conditionals in Dynamic Syntax. In R. Kempson & E. Gregoromichelaki (Eds.), *The Dynamics of Lexical Interfaces*. Stanford, California: CSLI Publications.

Grubic, Mira. (2010). Ngizim fieldnotes. *Interdisciplinary studies on information structure : ISIS ; working papers of the SFB 632*(13), 1-76.

Güldemann, Tom, Zerbian, Sabine, & Zimmermann, Malte. (2015). Variation in Information Structure with Special Reference to Africa. *Annual Review of Linguistics, 1*(1), 155-178. doi: 10.1146/annurev-linguist-030514-125134

Gundel, Jeanette K. (1977). *Role of topic and comment in linguistic theory*. Bloomington: Indiana University Linguistics Club.

Gundel, Jeanette K. (1988). Universals of topic-comment structure. In M. Hammond, E. Moravcsik & J. R. Wirth (Eds.), *Studies in Syntactic Typology* (pp. 209-239). Amsterdam: John Benjamins.

Guntsetseg, Dolgor. (2016). *Differential case marking in Mongolian*. Wiesbaden: Harrasowitz Verlag.

Halliday, Michael A. K. (1967). Notes on transitivity and theme in English (part II). *Journal of Linguistics, 3*, 199 - 244.

Hamblin, Charles Leonard. (1973). Questions in Montague English. *Foundations of Language, 10*, 41–53.

Hartmann, Katharina, & Zimmermann, Malte. (2009). Morphological Focus Marking in Gùrùntùm (West Chadic). *Lingua, 119*(9), 1340-1365.

Herring, Susan C. . (1990). Information structure as a consequence of word order type. In K. Hall, J.-P. Koenig, M. Meacham, S. Reinman & L. Sutton (Eds.), *Proceedings of the 16th Annual Berkeley Linguistics Society (BLS-16)* (pp. 163-174): Berkeley Linguistics Society

Hilbert, David, & Bernays, Paul. (1939). Grundlagen der Mathematik. *Julius Springer, II*.

Hook, Peter Edwin. (1974). *The Compound Verb in Hindi.* (PhD Thesis), University of Pennsylvania.

Hook, Peter Edwin. (1991). The emergence of perfective aspect in Indo-Aryan languages. In E. Traugott & B. Heine (Eds.), *Approaches to grammaticalization* (Vol. 1, pp. 59-89). Amsterdam: John Benjamins.

Hook, Peter Edwin. (1993). Aspectogenesis and the compound verb in Indo-Aryan. In M. K. Verma (Ed.), *Complex predicates in South Asian languages* (pp. 97-114). New Delhi: Manohar.

Kachru, Yamuna. (2006). *Hindi*: John Benjamins Publishing Company.

Kachru, Yamuna. (2008). Hindi-Urdu-Hindustani. In B. B. Kachru, Y. Kachru & S. N. Sridhar (Eds.), *Language in South Asia*: Cambridge University Press.

Karttunen. (1974). Presuppositions and linguistic context. *Theoretical Linguistics, 1*, 181-194.

Kempson, Ruth, & Cann, Ronnie. (2007). Dynamic Syntax and dialogue modelling: preliminaries for a dialogue-driven account of syntactic change. In J. C. Salmons & S. Dubenion-Smith (Eds.), *Historical Linguistics 2005: Selected papers from the 17th International Conference on Historical Linguistics* (pp. 73-100): John Benjamins.

Kempson, Ruth, & Cann, Ronnie. (2018). Grammar as Procedures: Language, Interaction, and the Predictive Turn *Pragmatics, Truth and Underspecification* (pp. 261-299). Leiden: Brill.

Kempson, Ruth, Cann, Ronnie, Eshghi, Arash, Gregoromichelaki, Eleni, & Purver, Matthew. (2015). Ellipsis. In S. Lappin & C. Fox (Eds.), *The Handbook of Contemporary Semantic Theory* (2 ed.): Wiley-Blackwell.

Kempson, Ruth, Cann, Ronnie, Gregoromichelaki, Eleni, & Chatzikyriakidis, Stergios. (2016). Language as Mechanisms for Interaction *Theoretical Linguistics* (Vol. 42, pp. 203).

Kempson, Ruth, Cann, Ronnie, & Kiaer, Jieun. (2004). Topic, Focus and the Structural Dynamics of Language. Retrieved from: www.kcl.ac.uk/innovation/groups/ds/publications/assets/kck04tfsdl.pdf [last accessed: 17 September 2019]

Kempson, Ruth, Cann, Ronnie, & Marten, Lutz. (2013). Tree growth dynamics. *STIL Studies in Linguistics, 6*(Special Issue on Directionality of Phrase Structure Building), 49-81.

Kempson, Ruth, Gregoromichelaki, Eleni, Eshghi, Arash, & Hough, Julian. (2019). Ellipsis in Dynamic Syntax. In J. van Craenenbroeck & T. Temmerman (Eds.), *The Oxford Handbook of Ellipsis* (pp. 205-232): Oxford University Press.

Kempson, Ruth, Gregoromichelaki, Eleni, & Eshghi, Arash

Hough, Julian. (2019). Ellipsis in Dynamic Syntax. In J. van Craenenbroeck & T.

Temmerman (Eds.), *The Oxford Handbook of Ellipsis* (pp. 205-232): Oxford University Press.

Kempson, Ruth, Gregoromichelaki, Eleni, Meyer-Viol, Wifried, Purver, Matthew, White, Graham, & Cann, Ronnie. (2011). Natural-language Syntax as Procedures for Interpretation: the Dynamics of Ellipsis Construal. In A. Lecomte & S. Tronçon (Eds.), *Ludics, Dialogue and Interaction* (pp. 114-133). Berlin/Heidelberg: Springer-Verlag.

Kempson, Ruth, & Kiaer, Jieun. (2009a). Japanese Scrambling and the Dynamics of On-line Processing. In H. Hoshi (Ed.), *Language, Mind and Brain: Perspectives from Linguistics and Cognitive Neuroscience*. Tokyo: Kuroshio.

Kempson, Ruth, & Kiaer, Jieun. (2009b). Multiple long-distance scrambling: Syntax as reflections of processing. *Journal of Linguistics, 46*(1), 127-192. doi: 10.1017/S0022226709990211

Kempson, Ruth, Kiaer, Jieun, & Cann, Ronnie. (2009). Periphery Effects and the Dynamics of Tree Growth. In B. Shaer, P. Cook, W. Frey & C. Maienborn (Eds.), *Dislocated Elements in Discourse: Syntactic Semantics and Pragmatic Perspectives*: Routledge.

Kempson, Ruth, & Kurosawa, Akiko. (2009). At the Syntax Pragmatics Interface: Japanese Relative Clause Construal In H. Hoshi (Ed.), *The Dynamics and Mechanism of Language: Perspectives from Linguistics and Cognitive Neuroscience* (pp. 47-84).

Kempson, Ruth, Meyer-Viol, W, & Gabbay, D. (2001). *Dynamic Syntax*. Oxford: Blackwell.

Kempson, Ruth, & Meyer-Viol, Wilfried. (2001). Relative clauses, left-periphery effects, and the dynamics of language processing. Retrieved from: http://sas-space.sas.ac.uk/844/1/R_Kempson_Relative.pdf [last accessed: 17 September 2019]

Kiaer, Jieun. (2007). *Processing and interfaces in syntactic theory: the case of Korean.* (PhD thesis), King's College London.

Kiaer, Jieun. (2011). Word Order Variation in Korean. In R. Kempson, Gregoromichelaki, E. and Howes, (Ed.), *The Dynamics of Lexical Interfaces* (pp. 165-204): CSLI Publications.

Kidwai, Ayesha. (1999). Word Order and Focus Positions in Universal Grammar. In G. Rebuschi & L. Tuller (Eds.), *The Grammar of Focus* (pp. 213-244). Amsterdam: John Benjamins.

Kidwai, Ayesha. (2000). *XP-Adjunction in Universal Grammar: Scrambling and Binding in Hindi-Urdu*. Oxford: Oxford University Press.

King, Tracy Holloway. (1997). Focus domains and information structure. In M. Butt & T. H. King (Eds.), *Proceedings of the LFG97 Conference*. San Diego: CSLI Publications.

Klein, Udo, & de Swart, Peter. (2011). Case and referential properties. *Lingua, 121*(1), 3-19. doi: https://doi.org/10.1016/j.lingua.2010.07.005

Krifka, Manfred. (2007). Basic notions of information structure. In C. Fery & M. Krifka (Eds.), *Interdisciplinary Studies on Information Structure* (Vol. 6, pp. 13-55). Potsdam: Universitätsverlag.

Krifka, Manfred. (2008). Basic notions of information structure. *Acta Linguistica Hungarica, 55*(3-4), 243-276. doi: 10.1556/ALing.55.2008.3-4.2

Krifka, Manfred, & Musan, Renate. (2012). Information structure: Overview and linguistic issues. In M. Krifka & R. Musan (Eds.), *The Expression of Information Structure* (pp. 1-44).

Lambrecht, Knud. (1994). *Information Structure and Sentence Form: Topic, Focus, and the Mental Representations of Discourse Referents*. Cambridge: Cambridge University Press.

Lambrecht, Knud. (2000). When subjects behave like objects: An analysis of the merging of S and O in Sentence-Focus Constructions across languages. *Studies in Language, 24*(3), 611-682. doi: https://doi.org/10.1075/sl.24.3.06lam

Lee, Hanjung. (2001). Markedness and Word Order Freezing. In P. Sells (Ed.), *Formal and Empirical Issues in Optimality Theoretic Syntax* (pp. 63-127): CSLI Publications.

Leonetti, Manuel. (2004). Specificity and Differential Object Marking in Spanish. *Catalan Journal Of Linguistics, 3*(1), 75-114. doi: doi.org/10.5565/rev/catjl.106

Liu, Wei, & Kempson, Ruth. (2018). Chinese cleft structures and the dynamics of processing. *Transactions of the Philological Society, 116*(1), 91-116. doi: 10.1111/1467-968x.12106

Löbner, Sebastian. (1985). Definites. *Journal of Semantics, 4*(4), 279-326. doi: 10.1093/jos/4.4.279

Mahajan, Anoop Kumar. (1990). *The A/A-Bar Distinction and Movement Theory.* (PhD Thesis), Massachusetts Institute of Technology.

Malchukov, Andrej L. (2008). Animacy and asymmetries in differential case marking. *Lingua, 118*(2), 203-221. doi: https://doi.org/10.1016/j.lingua.2007.02.005

Manetta, Emily. (2010). Wh-expletives in Hindi-Urdu: The vP phase. *Linguistic Inquiry, 41*(1), 1-34.

Marten, Lutz. (2002). *At the syntax-pragmatics interface : verbal underspecification and concept formation in dynamic syntax*. Oxford: Oxford University Press.

Marten, Lutz. (2007). Focus strategies and the incremental development of semantic representations: Evidence from Bantu *Focus Strategies in African LanguagesThe Interaction of Focus and Grammar in Niger-Congo and Afro-Asiatic*.

Marten, Lutz. (2013). Formal Syntax and African Languages: Dynamic Syntax Case Studies of Swahili, Bemba, and Hadiyya. *SOAS Working Papers in Linguistics Volumes, 16*, 195-213.

Marten, Lutz, & Kula, Nancy C. (2011). The Prosody of Bemba Relative Clauses. In R. Kempson, E. Gregoromichelaki & C. Howes (Eds.), *The Dynamics of Lexical Interfaces* (Vol. Studies in Constraint-Based Lexicalism). Stanford: CSLI Publications.

Matić, Dejan. (2015). Information Structure in Linguistics. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)* (pp. 95-99). Oxford: Elsevier.

Matić, Dejan, & Wedgwood, Daniel. (2013). The meanings of focus: The significance of an interpretation-based category in cross-linguistic analysis. *Journal of Linguistics, 49*(1), 127-163. doi: 10.1017/S0022226712000345

Meyer-Viol, Wilfried, Kempson, Ruth, Kibble, Rodger, & Gabbay, Dov. (1999). Indefinites as Epsilon Terms: A Labelled Deduction Account. In H. Bunt & R. Muskens (Eds.), *Computing Meaning: Volume 1* (pp. 203-218). Dordrecht: Springer Netherlands.

Mohanan, Tara. (1990). *Arguments in Hindi.* (PhD Thesis), Stanford University.

Mohanan, Tara. (1992). *Word order in Hindi. Paper presented at the Syntax Workshop. Stanford University*.

Mohanan, Tara. (1994). *Argument Structure in Hindi*: Cambridge University Press.

Mohanan, Tara. (1995). Wordhood and Lexicality: Noun Incorporation in Hindi. *Natural Language & Linguistic Theory, 13*(1), 75-134.

Molnár, Valéria. (2002). Contrast - from a contrastive perspective. In H. Hasselgård, S. Johansson, B. Behrens & C. Fabricius-Hansen (Eds.), *Information Structure in a Cross-Linguistic Perspective* (pp. 147-161). Leiden, The Netherlands: Brill | Rodopi.

Molnár, Valéria, & Järventausta, Marja. (2003). Discourse configurationality in Finnish and Hungarian. In J. Hetland & V. Molnár (Eds.), *Structures of Focus and Grammatical Relations* (pp. 111–148). Berlin, Boston: De Gruyter.

Montaut, Annie. (2003). Oblique main arguments in Hindi as localizing predications: Questioning the category of subject. In P. Bhaskararao & K. V. Subbarao (Eds.), *Non-nominative Subjects* (Vol. 2, pp. 33-56). Amsterdam: John Benjamins.

Montaut, Annie. (2004). *A grammar of Hindi*. Muenchen: LINCOM Europa.

Montaut, Annie. (2015). The discourse particle to and word ordering in Hindi: From grammar to discourse. In J. Fernandez Vest & R. Van Valin (Eds.), *Information Structuring in Spoken Languages from a Cross-linguistic Perspective* (Vol. 283, pp. 263-282). Amsterdam: John Benjamins.

Montaut, Annie. (2016). The verbal form V-a in Hindi/Urdu: An aorist with "aoristic" meanings. In Z. Guentchéva (Ed.), *Aspectuality and Temporality: Descriptive and theoretical issues* (pp. 413-446): John Benjamins Publishing Company.

Montaut, Annie. (2017). Grammaticalization of participles and gerunds in Indo-Aryan: Preterite, future, infinitive. In W. Bisang & A. Malchukov (Eds.), *Unity and diversity in grammaticalization scenarios* (pp. 97–136). Berlin: Language Science Press.

Montaut, Annie. (2018). The rise of differential object marking in Hindi and related languages. In I. A. Seržant & A. Witzlack-Makarevich (Eds.), *Diachrony of differential argument marking* (pp. 281–313). Berlin: Language Science Press.

Morimoto, Yukiko. (2000). *Discourse configurationality in Bantu morphosyntax.* (PhD thesis), Stanford University, Stanford, CA.

Muysken, P. (1995). Focus in Quechua. In K. É. Kiss (Ed.), *Discourse configurational languages* (pp. 375-393). New York, NY, Oxford, UK: Oxford University Press.

Narasimhan, Bhuvana. (1998). A Lexical Semantic Explanation for 'Quirky' Case Marking in Hindi. *Studia Linguistica, 52*(1), 48-76. doi: doi:10.1111/1467-9582.00029

Newmeyer, Frederick J. (2003). 'Basic Word Order' in Formal and Functional Linguistics and the Typological Status of 'Canonical' Sentence Types. In D. Willems, B. Defrancq, T. Colleman & D. Noël (Eds.), *Contrastive Analysis in Language: Identifying Linguistic Units of Comparison* (pp. 69-88). London: Palgrave Macmillan UK.

Nikolaeva, Irina. (2001). Secondary topic as a relation in information structure. *Linguistics, 39*, 1-49.

Nordlinger, Rachel. (1998). *Constructive case : evidence from Australian languages*. Stanford: CSLI Publications.

Onea, Edgar. (2007). Exhaustivity, focus and incorporation in Hungarian. In M. Aloni, P. Dekker & F. Roelofsen (Eds.), *Proceedings of the Sixteenth Amsterdam Colloquium* (pp. 169-174).

Onea, Edgar, & Beaver, David (2009). Hungarian Focus is not Exhausted *Proceedings of Semantics and Linguistics Theory conference (SALT) XIX* (pp. 342-359). Ithaca, NY: CLC Publications.

Partee, Barbara. (1987). Noun phrase interpretation and type-shifting principles. In D. d. J. Jeroen Groenendijk & M. Stokhof (Eds.), *Studies in Discourse Representation Theory*

and the theory of generalized quantifiers (pp. 115-143). Dordrecht: Foris Publications.

Payne, Thomas E. (1997). *Describing morphosyntax: A guide for field linguists*. Cambridge: Cambridge University Press.

Peregrin, Jaroslav, & von Heusinger, Klaus. (1995). Dynamic semantics with choice functions. *Choice Functions in Natural Language Semantics. Arbeitspapier, 71*, 329-353.

Phillips, Maxwell, P. (2014). Case innovation and agentive marking: A comparative overview of Central Indo-Aryan. *Journal of South Asian Languages and Linguistics, 1*(2), 157-185. doi: 10.1515/jsall-2014-0009

Poornima, Shakthi. (2012). *Hindi Complex Predicates at the Syntax-Semantics Interface.* (PhD Thesis), University at Buffalo, State University of New York. Retrieved from: https://arts-sciences.buffalo.edu/content/dam/arts-sciences/linguistics/AlumniDissertations/Poornima%20dissertation.pdf [last accessed: 17 September 2019]

Poornima, Shakthi, & Koenig, Jean-Pierre. (2009). Hindi Aspectual Complex Predicates. In S. Müller (Ed.), *Proceedings of the 16th International Conference on Head-Driven Phrase Structure Grammar* (pp. 276-296). Stanford, CA: CSLI Publications.

Prasad, Rashmi. 2000 In, 66–71. Lancaster University. (2000). A Corpus Study of Zero Pronouns in Hindi: An Account Based onCentering Transition Preferences *Proceedings of the Discourse Anaphora and Reference Resolution Conference (DAARC2000)* (pp. 66–71). Lancaster University.

Prince, Ellen. (1981). Toward a taxonomy of given/new information. In P. Cole (Ed.), *Radical pragmatics* (pp. 223-254). New York: Academic Press.

Radden, Günter. (2009). Generic reference in English: A metonymic and conceptual blending analysis In K.-U. Panther, L. L. Thornburg & A. Barcelona (Eds.), *Metonymy and Metaphor in Grammar* (25 ed., pp. 199–228): John Benjamins.

Ramchand, Gillian. (1993). *Aspect and Argument Structure in Scottish Gaelic.* (PhD Thesis), Stanford University.

Repp, Sophie. (2010). Defining 'contrast' as an information-structural notion in grammar. *Lingua, 120*(6), 1333-1345. doi: https://doi.org/10.1016/j.lingua.2009.04.006

Repp, Sophie. (2016). Contrast: Dissecting an Elusive Information-structural Notion and its Role in Grammar. In C. Féry & S. Ishihara (Eds.), *Handbook of Information Structure*: Oxford University Press.

Rizzi, Luigi. (1997). The Fine Structure of the Left Periphery. In L. Haegeman (Ed.), *Elements of Grammar: Handbook in Generative Syntax* (pp. 281-337). Dordrecht: Springer Netherlands.

Rodríguez-Mondoñedo, Miguel. (2007). *The syntax of objects: Agree and Differential Object Marking.* (PhD thesis), Universeity of Connecticut.

Rooth, Mats. (1985). *Association with Focus.* (PhD Thesis), University of Massachusetts at Amherst.

Rooth, Mats. (1992). A theory of focus interpretation. *Natural Language Semantics, 1*, 75-116.

Saeed, John I. (1999). *Somali*. Amsterdam and Philadelphia: John Benjamins.

Saleemi, Anjum P. (2003). Case and Agreement in Hindi-Urdu

In R. Singh (Ed.), *The Yearbook of South Asian Languages and Linguistics* (pp. 131-153). Berlin, Boston: De Gruyter Mouton.

Sánchez, Liliana. (2010). *The Morphology and Syntax of Topic and Focus: Minimalist inquiries in the Quechua periphery*: John Benjamins.
Seraku, Tohru. (2013). *Clefts, relatives, and language dynamics: the case of Japanese.* (PhD Thesis), Oxford University, UK.
Sgall, Petr, Hajičová, Eva, & Panevová, Jarmila. (1986). *The meaning of the sentence in its semantic and pragmatic aspects*. Dordrecht: Academia.
Shapiro, M.C. (1989). *A Primer of Modern Standard Hindi*: Motilal Banarsidass.
Sharma, Devyani. (1999). Nominal clitics and constructive morphology in Hindi. In M. Butt & T. H. King (Eds.), Proceedings of the LFG99 Conference. Stanford: CSLI Publications. Retrieved from: http://web.stanford.edu/group/cslipublications/cslipublications/LFG/4/lfg99sharma.pdf (last accessed: 17 September 2019).
Simpson, Andrew, & Choudhury, Arunima. (2015). The Nonuniform Syntax of Postverbal Elements in SOV Languages: Hindi, Bangla, and the Rightward Scrambling Debate. *Linguistic Inquiry, 46*(3), 533-551. doi: 10.1162/LING_a_00191
Singh, Mona. (1994). *Perfectivity, Definiteness, and Specificity: A Classification of Verbal Predicates in Hindi.* (PhD thesis), University of Texas at Austin. Retrieved from: https://books.google.co.uk/books?id=S0vKZwEACAAJ [last accessed 17 September 2019]
Singh, Mona. (1998). On the Semantics of the Perfective Aspect. *Natural Language Semantics, 6*(2), 171-199. doi: 10.1023/a:1008208311200
Skopeteas, Stavros (Ed.). (2012). *The empirical investigation of information structure*. Berlin, Boston: De Gruyter Mouton.
Skopeteas, Stavros, Fiedler, Ines, Hellmuth, Sam, Schwarz, Anne, Stoel, Ruben, Fanselow, Gisbert, . . . Krifka, Manfred. (2006). *Questionnaire on Information Structure (QUIS): Reference Manual* (Vol. 4): Universitätsverlag Potsdam.
Spencer, Andrew. (2005). Case in Hindi. In M. Butt & T. H. King (Eds.), *Proceedings of LFG '05* (pp. 429-446): CSLI Publications.
Srivastav, Veneeta. (1991). The Syntax and Semantics of Correlatives. *Natural Language & Linguistic Theory, 9*(4), 637-686.
Stalnaker, Robert. (1974). Pragmatic Presuppositions. In R. Stalnaker (Ed.), *Context and Content* (pp. 47-62): Oxford University Press.
Stalnaker, Robert. (1999). *Context and Content : Essays on Intentionality in Speech and Thought*. Oxford: Oxford University Press.
Stalnaker, Robert. (2002). Common ground. *Linguistics and Philosophy, 25*(5-6), 701-721.
Stalnaker, Robert. (2014). *Context*. Oxford; New York: Oxford University Press.
Steube, Anita. (2004). Information structure: Theoretical and empirical aspects. In E. Hajičová & P. Sgall (Eds.), *Degree of contrast and the topic-focus articulation* (pp. 1-13). Berlin: de Gryuter.
Subbārāo, K.V. (2012). *South Asian Languages: A Syntactic Typology*: Cambridge University Press.
Sulger, Sebastian. (2016). *Discontinuous Genitives in Hindi/Urdu.* Paper presented at the Workshop on Discontinuous Structures in Natural Language Processing (DiscoNLP), San Diego, California.
Vallduví, Enric. (1992). *The informational component*. New York: Garland.
Vallduví, Enric, & Engdahl, Elisabet. (1996). The linguistic realization of information packaging. *Linguistics, 34*, 459-519.

Vallduví, Enric, & Vilkuna, Maria. (1998). On Rheme and Kontrast. In P. Culicover & L. McNally (Eds.), *The limits of syntax. Syntax and Semantics* (Vol. 29, pp. 79-108). San Diego, London, Boston, New York, Sydney, Tokyo, Toronto: Academic Press.

van der Wal, Jenneke. (2009). *Word order and information structure in Makhuwa-Enahara*. Utrecht: LOT.

van der Wal, Jenneke. (2014). Tests for focus. In D. El Zarka & S. Heidinger (Eds.), Methodological Issues in the Study of Information StructureGrazer Linguistische Studien (Vol. 81, pp. 105-134). Graz: Universitätsbibliothek Graz. Retrieved from http://unipub.uni-graz.at/download/pdf/1275886?name=Zarka%20Dina%20El%20Heidinger%20Steffen%20Introduction [last accessed: 17 September 2019]

Varma, Terry. (2006). Some aspects of the meaning of the Hindi particle hii. In S. R. (Ed.), *The Yearbook of South Asian Languages and Linguistics (2006)* (pp. 87-122). Berlin, Boston: De Gruyter.

Verbeke, Saartje, & De Cuypere, Ludovic. (2009). The rise of ergativity in Hindi: Assessing the role of grammaticalization. *Folia Linguistica Historica, 43*(Historica vol. 30), 367-389. doi: 10.1515/FLIH.2009.006

Verma, M.K. (1971). *The Structure of the Noun Phrase in English and Hindi*. Delhi: Motilal Banarsidass.

von Heusinger, Klaus. (1997). Definite Descriptions and Choice Functions. In S. Akama (Ed.), *Logic, Language and Computation* (pp. 61-91). Dordrecht: Springer Netherlands.

von Heusinger, Klaus. (2002). Specificity and Definiteness in Sentence and Discourse Structure. *Journal of Semantics, 19*(3), 245-274. doi: 10.1093/jos/19.3.245

von Heusinger, Klaus. (2004). Choice functions and the anaphoric semantics of definite NPs. In K. Heusinger & R. Kempson (Eds.), *Research on Language and Computation* (Vol. 2 pp. 309–329). Netherlands: Kluwer Academic Publisher.

von Heusinger, Klaus. (2011). Specificity. In K. von Heusinger, C. Maienborn & P. Portner (Eds.), *Semantics* (Vol. 33.2, pp. 1025-1058). Berlin, Boston: De Gruyter.

von Heusinger, Klaus. (2013). The Salience Theory of Definiteness. In A. Capone, F. Lo Piparo & M. Carapezza (Eds.), *Perspectives on Linguistic Pragmatics* (pp. 349-374). Cham: Springer International Publishing.

von Heusinger, Klaus. (2019). Indefiniteness and Specificity. In J. Gundel & B. Abbott (Eds.), *The Oxford Handbook of Reference*: Oxford University Press.

von Heusinger, Klaus, & Kornfilt, J. (2017). Partitivity and case marking in Turkish and related languages. *Glossa: a journal of general linguistics, 2*(1), 20. doi: http://doi.org/10.5334/gjgl.112

Wedgwood, Daniel. (2005). *Shifting the Focus: From Static Structures to the Dynamics of Interpretation*. Oxford: Elsevier.

Wedgwood, Daniel. (2009). Variation in focus. In A. Riester & E. Onea (Eds.), *Focus at the syntax-semantics interface* (pp. 101-119). Stuttgart: University of Stuttgart.

Wedgwood, Daniel, Pethő, Gergely, & Cann, Ronnie (2006). *Hungarian 'focus position' and English it-clefts: the semantic underspecification of 'focus' readings*. MS.

Wu, Yicheng. (2011). The interpretation of copular constructions in Chinese: Semantic underspecification and pragmatic enrichment. *Lingua, 121*(5), 851-870. doi: https://doi.org/10.1016/j.lingua.2010.11.012

Zerbian, Sabine. (2006). *Expression of information structure in the Bantu language Northern Sotho.* (PhD Thesis), Humboldt University, Berlin.

Zimmermann, Malte. (2008). Contrastive focus and emphasis. *Acta Linguistica Hungarica, 55*(3-4), 347-360. doi: 10.1556/ALing.55.2008.3-4.9

Zimmermann, Malte. (2016). Information Structure. In M. Aronoff (Ed.), Oxford Bibliographies in Linguistics. Retrieved from: http://www.oxfordbibliographies.com/abstract/document/obo-9780199772810/obo-9780199772810-0130.xml?rskey=1dVH22&result=1&q=information+structure#firstMatch [last accessed: 17 September 2019]

Zimmermann, Malte, & Onea, Edgar. (2011). Focus marking and focus interpretation. *Lingua, 121*(11), 1651-1670. doi: 10.1016/j.lingua.2011.06.002

Appendix A

This appendix lists sources of data that was not recorded or elicited by me.

Emille Hindi Corpus (Written and Spoken)
https://www.lancaster.ac.uk/fass/projects/corpus/emille/ [last accessed: 17 September 2019]

News articles

[1]: BBC Hindi
https://www.bbc.com/hindi/international/2015/06/150603_vert_fut_cats_controls_our_mind_pk [last accessed: 17 September 2019]

[2]: Bhaskar
https://www.bhaskar.com/news/NAT-freedom-of-speech-story-4062101-NOR.html [last accessed: 17 September 2019]

[3]: BBC Hindi
https://www.bbc.com/hindi/science/2016/06/160610_vert_fut_why_british_love_tea_tk [last accessed: 17 September 2019]

[4]: Live Hindustan
https://www.livehindustan.com/uttarakhand/roorki/story-the-shraddhanjali-to-stephen-hawking-1852186.html [last accessed: 17 September 2019]

Stories on NYU website

Topii bechnevala aur bandar [टोपी बेचने वाला और बन्दर]
www.nyu.edu/gsas/dept/mideast/hindi/stories/hat.html [last accessed: 17 September 2019]

Kanjuus buRhiyaa aur sipaahii [कंजूस बुढ़िया और सिपाही]
www.nyu.edu/gsas/dept/mideast/hindi/stories/soldier.html [last accessed: 17 September 2019]

Other

Bharati, Dharamvir. *GunahoN kaa Devataa* (गुनाहों का देवता). 1949. Bharatiya Sahitya Inc., 2013

Thakur, Sunder Chand. *Pahaar aur Meraa Jiivaan*, 2019. Available at:
https://www.kafaltree.com/my-childhood-by-sundar-chand-thakur-17/ [last accessed: 17 September 2019]